

Exhibit 12 Part 7

Part 3 of Attachment J to the Allocation Recommendation Report (ARR1179-ARR1585)

United States' Motion to Enter Consent Decree,
United States v. Alden Leeds, Inc. et al., Civil Action No. 22-7326 (D.N.J.)

L3 Harris Technologies, Inc.

Diamond Alkali OU2 Allocation

ADR Confidential
Facility Data Report**L3 HARRIS TECHNOLOGIES, INC. F/K/A HARRIS CORPORATION**

Facility Name, Address and Size: The facility has historically comprised three contiguous areas owned and operated during different periods. The buildings comprising the facility carried the following street addresses: 100 Kingsland Road (now 77 River Road), Clifton, New Jersey; 500 Washington, 390 Washington, 417 River Road, 483 River Road, and 491/493 River Road, Nutley, New Jersey; 492 River Road, Nutley, New Jersey. At its largest, the area of the facility was approximately 149 acres; currently it consists of 26 acres. The facility was owned and operated under different names over time, including, International Telephone & Telegraph Corporation; ITT Avionics; ITT Defense Communications; ITT Industries, Inc.; ITT Corporation; ITT Avionics Div.; ITT Defense; ITT Aerospace Communications Division; Federal Telephone & Radio Corp.; Exelis, Inc. Information on the number of employees and shifts per day was not identified in the available file material.

1. **Business Type:** Defense communications, research and development, defense contractor, telephone/telegraph equipment (PAP-00204915; PAP-00199552)
2. **Time Period of Ownership/Operations**

The facility has historically comprised three contiguous areas:

- Kingsland Road Area [100 Kingsland Road (now 77 River Road), Clifton, New Jersey];
- Washington Avenue Area (500 Washington, 390 Washington, 417 River Road, 483 River Road, and 491/493 River Road, Nutley, New Jersey); and,
- River Road Area (492 River Road, Nutley, New Jersey).

Each area has been owned and operated during different, but overlapping periods.

Operator: 1946 to present (the operations and size of the facility have varied over time, as further described below).

Owner: 1941 to present (the size of the facility has varied over time, as further described below).

1941: ITT purchased the Washington Avenue Area in 1941 (PAP-00205092).

1946: ITT purchased the Kingsland Road Area in 1946 (PAP-00199552).

1952: ITT purchased the River Road Area in 1952 (PAP-00202991).

1993: Operations at the Washington Avenue Area and River Road Area ceased in 1993 (PAP-00203242-43).

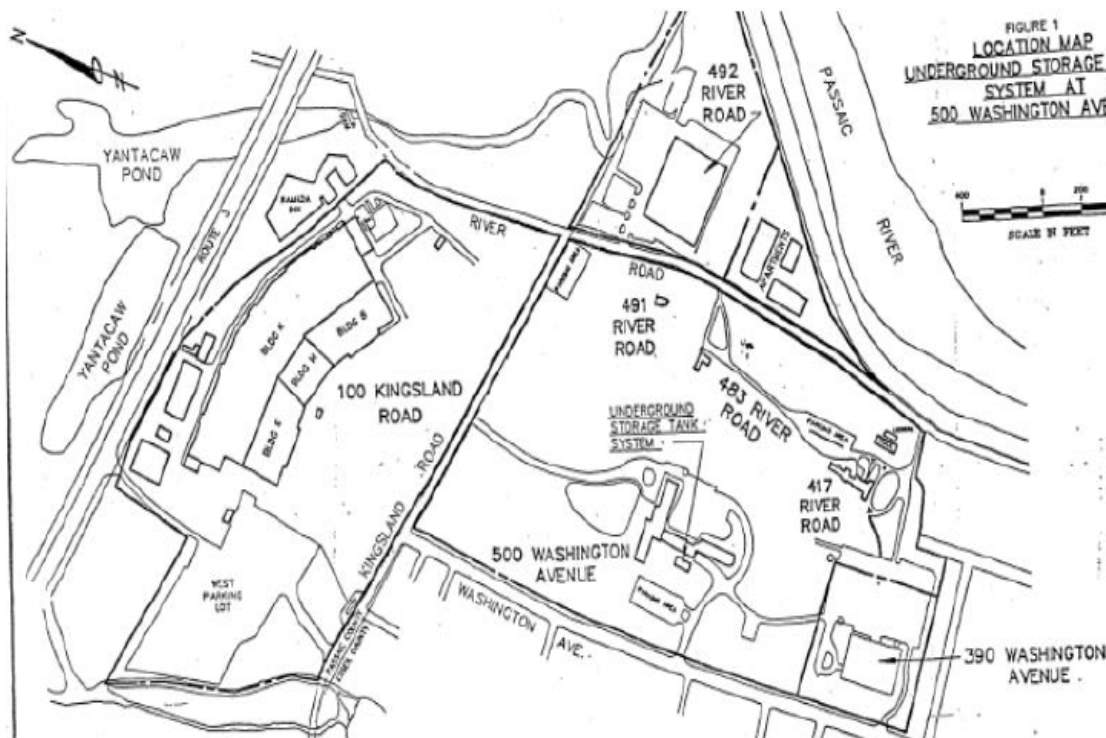
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- 1996: ITT Industries, Inc. sold the Kingsland Road Area in 1996 to Related Retail Corporation and then leased-back the area. After transfer of the title and execution of the lease, ITT Avionics Division continued to operate on-site (PAP-00199552; PAP-00204976).
- 1998: ITT Industries purchased the Kingsland Road Area back from Related Retail Corporation, excluding 10 acres (i.e., the western portion of the property), in 1998 (PAP-00199552).
- 2001: The Kingsland Road Area was subdivided into Block 83.01, Lot 1.01 and Block 83.01, Lot 1.02 in 2001. Lot 1.02 was sold for redevelopment. The address of the remaining 26 acres was changed from 100 Kingsland Road to 77 River Road (PAP-00204976; PAP-00199552).

The facility layout circa 1990 is depicted below (PAP-00202318):



3. Operational History/COC Use and Presence at the Facility

Kingsland Road Area

According to a *Preliminary Assessment and Site Investigation Report*, dated July 26, 2012, historical operations at the Kingsland Road Area included the manufacture of television and radio tubes, telephones, radios, and printed circuit boards (PAP-00199552).

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Facility operations included metal finishing and electroplating which were historically performed in an area of the facility directly east of the chemical storage room. These operations included solvent degreasing, acid etching, pickling, aqueous alkaline cleaning, plating, and electroplating (i.e., via plating baths consisting of cadmium, chromium, copper, lead, molybdenum, nickel, silver, tin, and zinc). Process baths were reportedly located throughout the area on elevated gratings. Process rinse water was discharged to concrete troughs, which drained to an industrial wastewater pretreatment system (PAP-00199563). The pretreatment system was located in the subbasement of the main building. Pretreatment consisted of chrome reduction (i.e., hexavalent to trivalent), metal hydroxide precipitation, and neutralization (PAP-00199806).

Pretreated process wastewater was discharged to the municipal sanitary sewer operated by the Passaic Valley Sewerage Commission (PVSC) pursuant to a permit between 1982 and 1990 (PAP-00199536; PAS-00111061-62). Sewer discharge monitoring was automatically performed at this location (PAP-00199559). During the period that the pretreatment process was in operation, pretreated discharges were monitored for metals (including copper and lead), among other parameters (PAP-00203244). The pretreatment system began operation in 1982 and was discontinued in 1990 because of the termination of process operations generating industrial wastewater (PAP-00199559). The *Preliminary Assessment and Site Investigation Report*, dated July 26, 2012, states that sanitary waste was discharged to the PVSC system beginning in 1946 (PAP-00199536). On July 6, 1990, the facility certified to PVSC that all uses of cadmium, nickel, silver, zinc, copper and lead had been discontinued for manufacturing purposes (PAP-00203260). Review of a *Community Right to Know Survey for 1995* states no OU2 contaminants of concern (COCs) were present as part of the facility's chemical inventory in 1995 (PAP-00199675-722). A *Community Right to Know Survey for 2000* also identified no OU2 COCs in the facility's chemical inventory (PAS-00110830-57).

As reported in the *Preliminary Assessment and Site Investigation Report*, dated July 26, 2012, in 2012 the property was being utilized for assembly, laboratory, testing, and office activities. Assembly operations included ancillary drilling, soldering, and wiring of units, some painting, printing, degreasing, machining, and grinding. The facility also performed some associated laboratory and product testing (PAP-00199554).

Washington Avenue Area

According to a *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, ITT operations at the Washington Avenue Area consisted primarily of research and development activities in support of manufacturing and assembly of electronic components and equipment for defense and intelligence applications. This included prototype designs and model construction in an electronic laboratory setting. Model construction involved soldering, printing, degreasing, drilling, machining, grinding, and testing of the products. Degreasing operations involved small spot degreasers in laboratory areas (PAP-00205011).

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According to a *Community Right to Know Survey for 1992*, lead was present at the facility. According to a *1992 Hazardous Waste Report*, "tin/lead solder dross bars for recycling" were generated by the facility and properly drummed and sent off-site to an EPA-licensed disposal facility, Halpern and Company, Inc. (PAP-00205075; PAP-00205039).

It is noted that a former dry well near the 500 Washington Avenue area may have received plating or acid wastes (PAP-00205108).

As reported in the *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, in 1993, the facility was inactive. Buildings remaining at the facility were 500 Washington Avenue, 390 Washington Avenue, the cafeteria/clubhouse at 417 River Road, the carpenter shop at 483 River Road, and the Admiral's house at 493 River Road. Only the building at 390 Washington Avenue was being used, serving as a temporary outplacement services office. All other buildings were closed (PAP-00205011).

River Road Area

According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, ITT operations at the River Road Area consisted of testing and assembling communications equipment used for satellite defense applications. Most of the facility housed small offices and electronics laboratories, with some rooms devoted to assembly of equipment. Manufacturing consisted mainly of assembly operations which included drilling, soldering and wiring of the units. Assembly involved manual, table-top operations, including soldering, printing, small scale plating, degreasing, acid/alkali cleaning, drilling, machining, grinding, assembling and testing of products. It is reported that "on occasion," ITT conducted small-scale plating operations at the facility in one small laboratory at the east end of the building (PAP-00199237).

According to a *Community Right to Know Survey for 1992*, no OU2 COCs were specifically listed as being present as part of the facility's chemical inventory in 1992 (PAP-00199251-268).

According to the *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, process rinse waters from the plating laboratory were disposed off-site as hazardous waste (PAP-00199237); however, a former plating rinse water dry well was also identified on the east side of the building. In addition, a former non-contact cooling water dry well was located on the east side of the building, and a former machine shop sink discharge point to a dry well was identified on the north side of the building (PAP-00199279, 287).

It is noted that according to the *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, prior to the purchase of the River Road Area, the eastern portion of that property was reportedly landfilled with municipal refuse immediately prior to construction of the facility. There were no records regarding the period of landfill activity, the types of waste disposed, or the manner of landfill closure; however, drilling revealed fill material to include coal, ash, glass, china, leather, rubber, cast iron and steel (PAP-

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00199213). NJDEP concurred that Historic Fill occupied a “much larger” area of the site than previously thought in a letter dated August 31, 1994 (PAP-00202981-83).

4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (used, detected)
- Lead (used, detected)
- Mercury (detected)

PCBs**Kingsland Road Area**

According to a *Preliminary Assessment and Site Investigation Report*, dated June 26, 2012, during visual inspection of transformers and switchgear conducted at the Kingsland Road Area in May 1996, three transformers were identified as having stains on concrete pads adjacent to the transformers as follows: 1) staining was observed on a transformer pad located on the south side of the boiler house (100 Kingsland Road (now 77 River Road) ; 2) staining was observed on an interior concrete floor in a subbasement adjacent to electrical systems; and, 3) staining was observed on the concrete transformer pad located on the north side of the main building. Concrete chip samples were collected at the stained areas and analyzed for polychlorinated biphenyls (PCBs) (PAP-00199564; PAS-00111066). The maximum detected concentration of total PCBs in concrete chips was 6.24 milligrams per kilogram (mg/kg) in 1997 (PAP-00200025). PCBs were detected in two soil samples collected below the concrete. The maximum detected concentration of total PCBs detected in soil below the concrete was 0.054 mg/kg in 1997 (PAP-00200026).

PAHs**Kingsland Road Area**

Six underground storage tanks (USTs), identified as UST systems E1 through E6, were closed and removed from the northern side of the Kingsland Road Area, north of the former boiler house between July 12, 1990, and October 25, 1990. UST systems E1 through E4 were 22,000 gallons in capacity and were used for the storage of No. 6 fuel oil. UST systems E5 and E6 were 2,000 and 6,000 gallons in capacity, respectively, and were used for the storage of No. 4 fuel oil. Four post-excavation subsurface soil samples were analyzed for PAHs. Detected concentrations of PAHs (in mg/kg) were as follows (PAP-00199883):

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Facility Data Report**Semi-Volatile Organic Compounds:**

Fluoranthene	<0.71	NA	NA	0.29	NA	<0.78	0.35	NA	NA	NA	NA	0.11
Pyrene	<0.71	NA	NA	0.76	NA	<0.78	0.72	NA	NA	NA	NA	0.24
Bis (2-Ethylhexyl) phthalate	<0.71	NA	NA	0.39	NA	<0.78	5.60	NA	NA	NA	NA	1.40
Chrysene	<0.71	NA	NA	3.90	NA	<0.78	0.40	NA	NA	NA	NA	0.12
Benzo (A) anthracene	<0.71	NA	NA	0.37	NA	<0.78	0.38	NA	NA	NA	NA	0.11
Benzo (B) fluoranthene	<0.71	NA	NA	0.31	NA	<0.78	0.36	NA	NA	NA	NA	<0.72
Benzo (K) fluoranthene	<0.71	NA	NA	0.11	NA	<0.78	0.087	NA	NA	NA	NA	<0.72
Benzo (A) pyrene	<0.71	NA	NA	0.20	NA	<0.78	0.25	NA	NA	NA	NA	0.13
Indeno (1,2,3-C,D) pyrene	<0.71	NA	NA	0.14	NA	<0.78	0.15	NA	NA	NA	NA	<0.72
Benzo (G,H,I) perylene	<0.71	NA	NA	0.11	NA	<0.78	0.18	NA	NA	NA	NA	0.20
Phenanthrene	<0.71	NA	NA	<0.74	NA	<0.78	0.25	NA	NA	NA	NA	1.50
Acenaphthene	<0.71	NA	NA	<0.74	NA	<0.78	<0.74	NA	NA	NA	NA	0.37
Fluorene	<0.71	NA	NA	<0.74	NA	<0.78	<0.74	NA	NA	NA	NA	0.66

According to the June 2012 Preliminary Assessment and Site Investigation Report, no further action was required for the soils in this area, since all parameters were below NJDEP's Impact to Groundwater Soil Cleanup Criteria and NJDEP's Residential Direct Contact Soil Cleanup Criteria (PAP-00199805).

Washington Avenue Area

According to a *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, a former dry well near the 500 Washington Avenue area was considered a potential concern because it may have received plating or acid wastes (PAP-00205108). High and low molecular weight PAHs were detected in subsurface soil associated with the dry well at a depth of three to four feet (PAP-00205108, 136). Detected concentrations of PAHs (in µg/kg) were as follows (PAP-00205136):

fluorene	390 J
phenanthrene	2,200
anthracene	560
fluouranthene	2,400
pyrene	1,900
benzo(a)anthracene	1,200
chrysene	1,200
benzo(b,k)fluouranthene	1800 L
benzo(a)pyrene	1,100
indeno(1,2,3-cd)pyrene	710
dibenz(a,h)anthracene	390 J
benzo(g,h,i)perylene	610

River Road Area

According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, between October 31, 1990 and November 2, 1990, a 20,000-gallon UST system used to store No. 2 fuel oil was evacuated of its contents, excavated and removed in accordance with a New Jersey Department of Environmental Protection (NJDEP)-approved UST closure plan. Post-excavation samples were collected and high and low molecular weight PAHs were detected (PAP-00199288, 315). Detected concentrations of PAHs (in mg/kg) were as follows (PAP- 00199315):

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phenanthrene	.32	.077
anthracene	.08	ND
fluouranthene	.37	.11
pyrene	.29	.08
bis(2 ethylhexyl)phthalate	.12	.18
chrysene	.16	.044
benzo(a)anthracene	.16	.049
benzo(b)fluouranthene	.19	.054
benzo(k)fluouranthene	.089	ND
benzo(a)pyrene	.15	.042
indeno(1,2,3-cd)pyrene	.08	ND
benzo(g,h,i)perylene	.073	ND

The NJDEP certified by letter dated July 13, 1992, that ITT Corporation had properly complied with the requirements regarding the 20,000 gallon UST and no additional corrective actions were necessary (PAP-00199231, 288).

CopperKingsland Road Area

According to Pretreatment Monitoring Reports, copper was detected in wastewater discharges as follows. The pre-treatment standard under the PVSC permit for copper was 3.36 mg/L (PAP-00203271). :

- Between January and June 1987, copper was detected in facility wastewater at concentrations ranging between 0.34 milligrams per liter (mg/L) and 2.44 mg/L (PAP-00203228-39).
- Between July and December 1987, copper was detected in facility wastewater at concentrations ranging between 0.34 mg/L and 5.0 mg/L (PAP-00203271-86). According to the associated monitoring report, "A single analysis exceeded the permit requirement [for copper] due to solids in the sample. Upon preservation of the sample, copper was released. Additional analyses were performed and are attached to show compliance with pre-treatment standards" (PAP-00203272).
- In January through June 1988, copper was detected in facility wastewater at a maximum concentration of 1.28 mg/L. In July through December 1988, copper was detected in facility wastewater at a maximum concentration of 1.03 mg/L (PAP-00426083).
- In January through June 1989, copper was detected in facility wastewater at a maximum concentration of 4.07 mg/L (PAP-00426124). The three-day average was 1.81 mg/L (PAP-00426145). In July through December 1989, copper was detected in facility wastewater at a maximum concentration of 1.20 mg/L (PAP-00426152).

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- Copper was detected in facility wastewater at a maximum concentration of 0.765 mg/L between January and June 1990 (PAP-00203246).
- In November 1994, copper was detected at outfalls 003 and 005 at maximum concentrations of 1 mg/L and 0.15 mg/L, respectively (PAP-00426311).
- In December 1996, copper was detected at outfall 003 at a concentration of 70 µg/L (PAP-00426318).
- In October 1997, copper was detected at outfall 003 at a maximum concentration of 80 µg/L (PAP-00426522).
- Copper was detected in facility wastewater in January 1998 at a concentration of 0.4 mg/L (PAP-00203321). In February 1998, copper was detected at outfall 003 at a concentration of 0.1 mg/L (PAP-00427182). In April 1998 it was detected at a concentration of 0.6 mg/L (PAP-00427339). In May 1998, it was listed at a concentration of 0.07 mg/L (PAP-00427432). In June 1998, it was listed at a concentration of 0.05 mg/L (PAP-00427528). In July 1998, it was listed at a concentration of 0.09 mg/L (PAP-00427598). In August 1998, it was listed at a concentration of 0.06 mg/L (PAP-00427667).
- The maximum detection of copper reported in the monitoring reports from January to May 1999 was 0.13 mg/L for both outfalls 003 and 005 (PAP-00722746-64). This was noted to exceed the threshold value for copper of 0.092 mg/L, but not the monthly average limit of 3.02 mg/L (PAP-00722287-9, 386-7, 768, 772).¹

Washington Avenue Area

According to a *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, a former dry well near the 500 Washington Avenue facility was considered a potential concern because it may have received plating or acid wastes (PAP-00205108). Copper was detected in subsurface soil at concentrations of 52.1 mg/kg at a depth of three to four feet (PAP-00205137).

River Road Area

According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, a discharge from a machine shop sink in the building was released via a pipe directly to a subsurface dry well in the ground on the north side of the building (PAP-00199292, 89). In addition, a former dry well for plating rinse water was located at the northeast corner of the building (PAP-00199293). Finally, a former dry well for non-contact cooling water was located at the northeast corner of the building (PAP-00199289). It is noted that according to a *Remedial Action Report*, dated February

¹ This Report was revised to include documents received on July 13, 2020. The additional documents did not change L3 Harris Technologies' previous certification.

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1997, facility personnel stated that the non-contact cooling water dry well did not receive industrial waste, but rather was a discharge point for storm water (roof drains) (PAP-00203004). All of these dry wells, except the machine shop sink discharge point, were located in historic fill, as confirmed by NJDEP (PAP-00202983).

It is noted that initially, the eastern portion of the River Road Area was reportedly landfilled with municipal refuse immediately prior to construction of the facility, prior to ITT's ownership of the property. It is reported that there are no records regarding the period of landfill activity, the types of waste disposed, or the manner of landfill closure, but that on-site drilling has revealed fill material to include coal, ash, glass, china, leather, rubber, cast iron, and steel (PAP-00199213). Later, additional evidence provided to NJDEP showed that the fill that predated ITT's ownership extended to almost the entire River Road Area. NJDEP itself concurred with the conclusion that fill "extends throughout the site..." in a letter dated August 31, 1994 (PAP-00202983). Metals detected in this area were attributed to former landfill activities (PAP-00199291). The NJDEP concurred that this area was historic fill (PAP-00202983).

Maximum concentrations of copper detected in 1991 and 1993 at the above-listed areas were as follows (PAP-00199290-293, 312, 316):

Maximum Copper Concentrations by Area of Concern (mg/kg)				
	Machine Shop Sink Discharge	Dry Well for Non-Contact Cooling Water	Dry Well for Plating Rinse Water	Municipal Landfill
Copper	2,380 (at 0.5 to one foot)	360 (at one to three feet)	360 (at one to three feet)	865 (at zero to two feet)

LeadKingsland Road Area

According to Pretreatment Monitoring Reports, lead was reported in conformance with the PVSC lead permit limit of 0.69 mg/L in wastewater discharges as follows:

- Between January and June 1987, lead was reported in facility wastewater at concentrations ranging between 0.04 mg/L and 0.16 mg/L (PAP-00203228-39).
- Between July and December 1987, lead was reported in facility wastewater at concentrations ranging between 0.03 mg/L and 0.14 mg/L (PAP-00203271-86).
- In January through June 1988, lead was detected in facility wastewater at a maximum concentration of 0.13 mg/L. In July through December 1988, lead was detected in facility wastewater at a maximum concentration of 0.03 mg/L (PAP-00426083).

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- In January through June 1989, lead was detected in facility wastewater at a maximum concentration of 0.237 mg/L (PAP-00426124). In July through December 1989, lead was detected in facility wastewater at a maximum concentration of 0.139 mg/L (PAP-00426152).
- Lead was reported in facility wastewater at a maximum concentration of 0.0283 mg/L between January and June 1990 (PAP-00203246).
- In 1991, the cooling water was listed as having a lead concentration of 0.0216 (PAP-00426050).
- In November 1994, lead was detected at outfalls 003 and 005 at maximum concentrations of 0.087 mg/L and 0.015 mg/L, respectively (PAP-00426311).
- In December 1996, lead was detected at outfalls 003 and 005 at concentrations of 18.1 µg/L and 20.5 µg/L (PAP-00426318, 19).
- In October 1997, lead was detected at outfall 005 at a maximum concentration of 163 µg/L (PAP-00426579). It was detected at outfall 003 at a maximum concentration of 8.4 µg/L (PAP-00426669).

Washington Avenue Area

According to a *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, a former dry well near the 500 Washington Avenue area was considered a potential concern because it may have received plating or acid wastes (PAP-00205108). Lead was detected in subsurface soil at concentrations of 57.6 mg/kg at a depth of three to four feet (PAP-00205137).

River Road Area

According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, a discharge from a machine shop sink in the building was released via a pipe directly to a subsurface dry well in the ground on the north side of the building (PAP-00199292). In addition, a former subsurface dry well for plating rinse water was located at the northeast corner of the building (PAP-00199293). Finally, a former subsurface dry well for non-contact cooling water was located at the northeast corner of the building (PAP-00199289). It is noted that according to a *Remedial Action Report*, dated February 1997, facility personnel stated that the non-contact cooling water dry well did not receive industrial waste, but rather was a discharge point for storm water (roof drains) (PAP-00203004). All of these areas, except the machine shop sink discharge, were located within the historic fill placed on the property prior to ITT's ownership, as confirmed by letter from NJDEP (PAP-00202983).

It is noted that initially, the eastern portion of the River Road Area was reportedly landfilled with municipal refuse immediately prior to construction of the facility, prior to ITT's ownership of the property. It is reported that there are no records regarding the

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period of landfill activity, the types of waste disposed, or the manner of landfill closure, but that on-site drilling has revealed fill material to include coal, ash, glass, china, leather, rubber, cast iron, and steel (PAP-00199213). Later, additional evidence provided to NJDEP showed that the fill that predated ITT's ownership extended to almost the entire River Road Area. NJDEP itself concurred with the conclusion that fill "extends throughout the site..." in a letter dated August 31, 1994 (PAP-00202983). Metals detected in this area were attributed to former landfill activities (PAP-00199291). The NJDEP concurred that this area was historic fill (PAP-00202983).

Maximum subsurface detected concentrations of lead detected in 1991 and 1993 at the above-listed areas were as follows (PAP-00199290-293, 312, 316-317):

Maximum Lead Concentrations by Area of Concern (mg/kg)				
	Machine Shop Sink Discharge	Dry Well for Non-Contact Cooling Water	Dry Well for Plating Rinse Water	Municipal Landfill
Lead	1,400 (at two to four feet)	2,470 (at one to three feet)	2,470 (at one to three feet)	1,710 (at zero to two feet)

Mercury**Washington Avenue Area**

According to a *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, a former dry well near the 500 Washington Avenue facility was considered a potential concern because it may have received plating or acid wastes (PAP-00205108). Mercury was detected in a subsurface soil sample at a concentration of 0.83 mg/kg at a depth of three to four feet (PAP-00205137).

River Road Area

According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, a discharge from a machine shop sink in the building (492 River Road) was released via a pipe directly to a subsurface dry well on the north side of the building (PAP-00199292). In addition, a former dry well for plating rinse water was located at the northeast corner of the building (PAP-00199293, 89). Finally, a former dry well for non-contact cooling water was located at the northeast corner of the building (PAP-00199289). It is noted that according to a *Remedial Action Report*, dated February 1997, facility personnel stated that the non-contact cooling water dry well did not receive industrial waste, but rather was a discharge point for storm water (roof drains) (PAP-00203004).

It is noted that initially, the eastern portion of the River Road Area was reportedly landfilled with municipal refuse immediately prior to construction of the facility, prior to ITT's ownership of the property. It is reported that there are no records regarding the period of landfill activity, the types of waste disposed, or the manner of landfill closure, but that on-site drilling has revealed fill material to include coal, ash, glass, china,

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leather, rubber, cast iron, and steel (PAP-00199213). Later, additional evidence provided to NJDEP showed that the fill that predated ITT's ownership extended to almost the entire River Road Area. NJDEP itself concurred with the conclusion that fill "extends throughout the site..." in a letter dated August 31, 1994 (PAP-00202983). Metals detected in this area were attributed to former landfill activities (PAP-00199291). The NJDEP concurred that this area was historic fill (PAP-00202983).

Maximum concentrations of mercury detected in 1991 and 1993 (with the concentration at the machine shop sink discharge location being detected at 0.5 to one feet) at the above-listed areas were as follows (PAP-00199290-293, 312, 316-317):

Maximum Mercury Concentrations by Area of Concern (mg/kg)				
	Machine Shop Sink Discharge	Dry Well for Non-Contact Cooling Water	Dry Well for Plating Rinse Water	Municipal Landfill
Mercury	2.1	Not Detected	Not Detected	Not Detected

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.²

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.³ Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.⁴ PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.⁵

²Digital Geodata Series, DGS04-7, *Historic Fill for New Jersey*, <https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm>, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

³ *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

⁴ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

⁵ NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, fill was encountered at the River Road Area. Boring log descriptions of the fill included ash, glass, china, leather, rubber, cast iron, steel and coal. The thickness of the fill ranged from approximately three feet to approximately 12 feet (PAP-00199283). The report goes on to state that the eastern portion of the River Road Area was reportedly landfilled with municipal refuse immediately prior to construction of the facility and predated ITT's ownership. It is reported that there are no records regarding the period of landfill activity, the types of waste disposed, or the manner of landfill closure (PAP-00199213), but metals detected in soil in this area were attributed to former landfill activities (PAP-00199291). In 1994, based on additional evidence provided by NJDEP, NJDEP concurred that historic fill "extends throughout the site [River Road Area]" (PAP-00202983).

The levels of copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00199312, 316-317).

COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	2,470 mg/kg
Copper	865 mg/kg
Mercury	2.1 mg/kg

5. COC Pathways

Prior to 1998, the Third River, a tributary of the Passaic River, bordered part of the Kingsland Road Area to the west, and flowed around to the facility to the west, north and east. To the north, the facility was bordered by State Highway Route 3. This tributary discharges to the Passaic River approximately one-quarter mile east of the facility (PAP-00199799).

Sanitary Sewer

Each area of the facility had its own PVSC sanitary sewer permit:

- The Kingsland Road Area held PVSC Sewer Connection Permit (03401703) (PAP-00203263). A copy of the permit was not identified in the available file material.
- The Washington Avenue Area held PVSC Sewer Connection Permit (24401713) (PAP-00205012, 32).
- The River Road area held PSVC Sewer Connection Permit (24403740) (PAP-00199240).

Additional details are discussed below by facility area.

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Kingsland Road Area

Sanitary wastewater, along with industrial process wastewater that was pretreated in an on-site wastewater treatment system, was discharged to the PVSC system between 1982 and 1990 pursuant to the PVSC permit. Discharge was monitored for copper and lead, among other parameters (PAP-00203244). The *Preliminary Assessment and Site Investigation Report*, dated July 26, 2012, states that sanitary waste was discharged to the PVSC system beginning in 1946 (PAP-00199536). As documented in 1990, discharges from the Kingsland Road Area to the PVSC system were via three outfalls. Industrial process wastewater was discharged to outfall 003 and outfall 005. Sanitary waste was discharged to outfall 004 (PAP-00203263). Discharge through outlets 003 and 005 appears to have been permitted through 2001 (PAP-00722300, 85-87).⁶

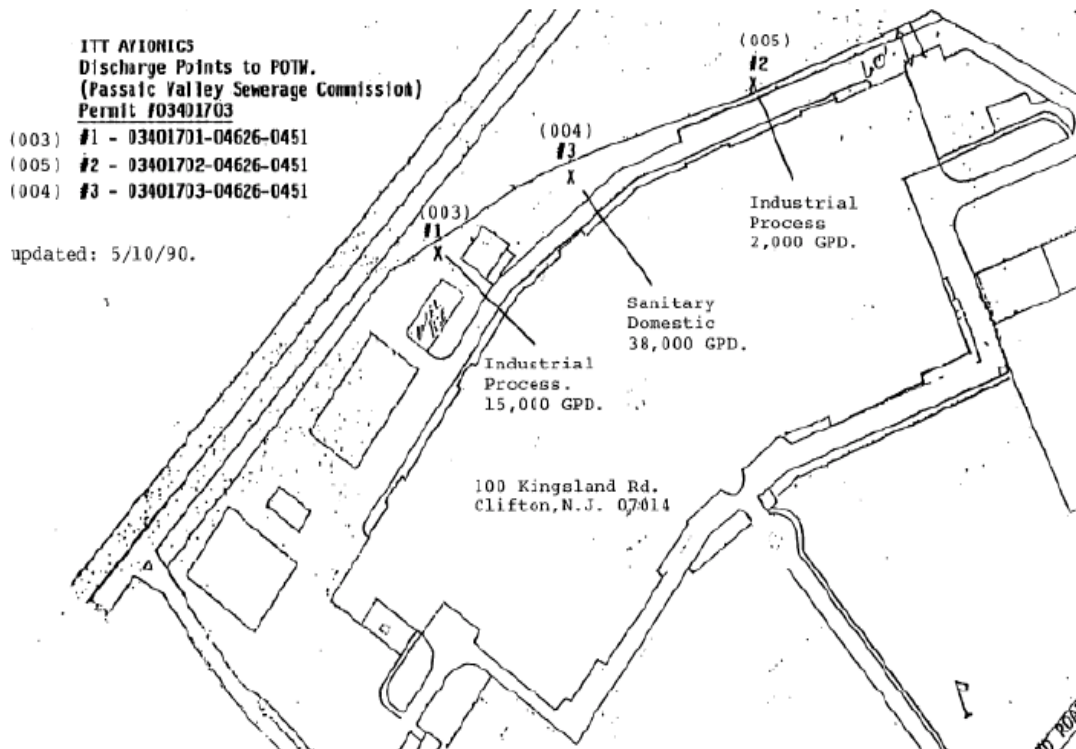
For the period of January through June 1988, a maximum flow volume of 140,950 gallons per day was reported for outfall 005 (PAP-00426063). For the period of July through December 1988, a maximum flow volume of 160,729 gallons per day was reported for outfall 005 (PAP-00426083). For the period of January through June 1989, a maximum flow volume of 163,658 gallons per day was reported for outfall 005 (PAP-00426124). For the period of July through December 1989, a maximum flow volume of 111,000 gallons per day was reported for outfall 005 (PAP-00426152). In 1990, process wastewater was discharged at a rate of 15,000 gallons per day out of outfall 003 and 2,000 gallons per day out of outfall 005. Sanitary waste was discharged out of outfall 004 at a discharge rate of 38,000 gallons per day (PAP-00203263).

A figure depicting the locations of the outfalls is below (PAP-00203263):

⁶ This Report was revised to include documents received on July 13, 2020. The additional documents did not change L3 Harris Technologies' previous certification.

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According to a *Preliminary Assessment and Site Investigation Report*, dated July 26, 2012, facility operations historically included metal finishing and electroplating (i.e., via plating baths consisting of cadmium, chromium, copper, lead, molybdenum, nickel, silver, tin, and zinc). Between 1982 and 1990, process baths were reportedly located throughout the area on elevated gratings. Process rinse water was discharged to concrete troughs which drained to an industrial wastewater pretreatment system (PAP-00199563). The pretreatment system was located in the subbasement of the main building. Pretreatment consisted of chrome reduction (i.e., hexavalent to trivalent), and metal hydroxide precipitation and neutralization (PAP-00199806). Process operations generating industrial wastewater ceased in 1990 (PAP-00199806).

From April 1 through June 30, 1991, the flow volume at outfall 003 was listed as 902,080 gallons and the flow volume at outfall 005 was listed as 265,450 gallons (PAP-00426044, 46). For June 1992, the flow volume at outfall 003 was listed as 14,734 gallons and the flow volume at outfall 005 was listed as 4,385 gallons (PAP-00426194). In October 1997, the flow volume at outfall 003 was listed as 23,698 gallons per day (PAP-00426674). In February 1998, the flow volume at outfall 003 was listed as 26,626.52 gallons per day and at outfall 005 was listed as 2,753.8 gallons per day (PAP-00427182, 84). In March 1998, the flow volume at outfall 003 was listed as 589,305 gallons and at outfall 005 was listed as 113,882 gallons (PAP-00427258, 60). In April 1998, the flow volume at outfall 003 was listed as 371,143 gallons and at outfall 005 was listed as 143,181 gallons (PAP-00427327, 29). In May 1998, the flow volume at outfall 003 was listed as 200,978 gallons and at outfall 005 was listed as 168,095 gallons (PAP-00427419, 21). In June 1998, the flow volume at outfall 003 was listed as 526,948 gallons and at outfall 005 was listed as 395,707 gallons (PAP-00427521, 23). In July

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1998, the flow volume at outfall 003 was listed as 270,906 gallons and at outfall 005 was listed as 932,774 gallons (PAP-00427593, 95). In August 1998, the flow volume at outfall 003 was listed as 17,658 gallons per day and at outfall 005 was listed as 16,092 gallons per day (PAP-00427667, 68). In December 1998, the flow volume at outfall 003 was listed as 32,845 gallons per day and at outfall 005 was listed as 4,434 gallons per day (PAP-00428078, 80).

Additional monitoring reports from January to May 1999 provided data for discharges through outfalls 003 and 005. The maximum flow through outlet 003 during this time period was reported as 29,052.1 gallons per day, and the maximum flow through outfall 005 was reported as 4,500.1 gallons per day (PAP-00722758, 60).⁷

According to the *Remedial Action Report*, dated September 1997, the pretreatment system continued to operate as a neutralization system in the event the pH of other industrial wastewater generated throughout the facility was outside of discharge limits (PAP-00199975).

The *Preliminary Assessment and Site Investigation Report*, dated July 26, 2012, states that at that time of the report, all industrial process wastes were containerized and staged on-site prior to off-site disposal (PAP-00199536).

Washington Avenue Area

According to the *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, sanitary wastewater was discharged to the PVSC system beginning as early as 1981 via a PVSC Sewer Connection Permit (24401713) (PAP-00204993, 5032). No discharge monitoring was required under this permit, which included discharge of sanitary waste only via three outfalls (PAP-00205015-18). ITT informed PVSC that operations and discharges had ceased on November 3, 1993 (PAP-00203242).

River Road Area

According to the *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, sanitary wastewater was discharged to the PVSC system beginning as early as 1991 to at least 1996 via one outfall (PAP-00199207, 240, 242). ITT was not required to monitor this discharge for OU2 COCs (PAP-00199242). On July 13, 1992, ITT certified that they did not have any discharges from the River Road Area (PAP-00426189).

Non-Contact Cooling Water and Stormwater DischargesKingsland Road Area and Washington Avenue Area

The Kingsland Road Area had a New Jersey Pollutant Discharge Elimination System (NJPDES) permit (NJ0020214) for discharge to the Third River and Passaic River at least as early as 1983 (PAP-00026354; PAP-00203103). According to a *Site Evaluation*

⁷ This Report was revised to include documents received on July 13, 2020. The additional documents did not change L3 Harris Technologies' previous certification.

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Submission and Cleanup Plan Report, dated July 1993, the Washington Avenue Area was also covered under this NJDPES permit (PAP-00204991). It is noted that ITT was not required to monitor discharges for OU2 COCs under this permit (PAP-00203109-11).

Discharges included stormwater and non-contact cooling water (PAP-00026354; PAP-00203103). Discharges were via outfall 001 (which discharged to the Third River) and outfalls 002 and 003 (which discharged to the Passaic River) (PAP-00204991, 5007).

According to a modification to the NJPDES permit, approved by NJDEP on October 31, 2001, ITT requested to eliminate discharge 001 and to monitor the discharge of non-contact cooling water out of outfalls 002 and 003 (PAP-00203113). The outfalls 002 and 003 referenced in the modification request discharged to the Third River, not the Passaic River (PAP-203119-121). On January 14, 2003, ITT requested that their NJPDES permit be revoked, as it had ceased non-contact cooling water discharges, and installed a closed loop recirculation system (PAP-00203162).

The *Preliminary Assessment and Site Investigation Report*, dated July 26, 2012, states that stormwater catch basins were observed throughout the exterior of the site during an October 2011 site reconnaissance. The report states that stormwater followed sheet flow across paved areas of the site and was collected in stormwater catch basins that ultimately discharge to the Third River located north and east of the site. ITT filed a "No Exposure Certification" and did not require permit authorization for its stormwater due to the existence of a condition of no exposure. No exterior hazardous material storage areas were observed during the October 2011 site reconnaissance. As stated above, the report states that historically the facility held a NJPDES Permit for the discharge of stormwater and non-contact cooling water to the Third River (PAP-00199568; PAP-00203173).

River Road Area

The River Road Area also had a NJPDES permit (NJ0020435) for stormwater discharges to the Third River and Passaic River (PAP-00199205, 216; PAP-00203149). The permit was issued on August 22, 1985, and discharges were described as "thermal surface water" discharges (PAP-00203157, 59). Information on volume of discharges was not identified. The permit was terminated on June 21, 1996 (PAP-00203157). A copy of the permit was not identified in the available file material. According to a July 7, 1980 NJDEP letter, the permittee shall discharge so as not to violate Water Quality Standards for tributaries to the Third River Classified as TW-2 waters pursuant to N.J.A.C.7:9-4.6(e) including: floating, suspended, colloidal, and settleable solids, color; Petroleum Hydrocarbons and other oils and grease, pH (between 6.5 and 8.5), and temperature (PAP-00203151-52).

Spills

There is no information regarding spills in the available file material.

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Facility Data Report**6. Regulatory History/Enforcement Actions*****Inspections***

NJDEP inspected the Kingsland Road Area on February 17, 1988, and gave the facility a rating of 'acceptable' for their NJPDES compliance (PAP-00203144).

Violations/Enforcement Actions

No violations or enforcement actions associated with OU2 COCs were identified in the available file material.

Settlements

It is noted that ITT entered into a Natural Resources Damages settlement with NJDEP in 2007 that provided ITT with a release and covenant not to sue for natural resource damages under the state Spill Act and federal CERCLA in return for conducting a storm water and park restoration project (PAP-000204429-49). NJDEP in responding to comments to the proposed settlement stated that the settlement was intended to apply to all areas both on-site and off-site, as based on their review of the environmental documentation, there had been no releases from the Facility off-site, and the only impact to natural resources from Facility operations was to on-site groundwater (PAP-00204430; PAP-00204909).

Permits

Each area of the site had its own PVSC permit:

- The Kingsland Road Area held PVSC Sewer Connection Permit (03401703) (PAP-00203263).
- The Washington Avenue Area held PVSC Sewer Connection Permit (24401713) (PAP-00205032).
- The River Road area held PSVC Sewer Connection Permit (24403740) (PAP-00199240).

The terms of each permit are described in the "Sanitary/Storm Sewer" subsection above. The Kingsland Road Area and Washington Avenue Area had a NJPDES permit (NJ0020214) for discharge to the Third River and Passaic River at least as early as 1983. Discharges included stormwater and non-contact cooling water (PAP-00026354; PAP-00203103; PAP-00204991). Discharges were via outfall 001 (which discharged to the Third River) and outfalls 002 and 003 (which discharged to the Passaic River) (PAP-00204991, 5007). On January 14, 2003, ITT requested that their NJPDES permit be revoked, as it had ceased non-contact cooling water discharges, and installed a closed loop recirculation system (PAP-00203162).

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The River Road Area also had a NJPDES permit (NJ0020435) for stormwater discharges to the Third River and Passaic River at least as early as 1985 (PAP-00199205, 216; PAP-00203149). The permit was terminated on June 21, 1996 (PAP-00203157).

7. Response Actions***Characterization Activities***

The following characterization activities have taken place at the facility:

- *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993 (PAP-00204989) (Washington Avenue Area);
- *Site Evaluation Submission and Remedial Action Plan*, dated October 1993 (PAP-00199203) (River Road Area);
- *Remedial Action Report*, dated February 27, 1995 (PAP-00200046, 48) (River Road Area);
- *Remedial Investigation Report and Remedial Action Work Plan*, dated August 8, 1996 (PAP-00199792) (Kingsland Road Area);
- *Remedial Action Report*, dated February 1997 (PAP-00202986) (River Road Area);
- *Remedial Action Report*, dated September 1997 (PAP-00199971) (Kingsland Road Area);
- *Preliminary Assessment and Site Investigation Report*, dated June 26, 2012 (PAP-00199530) (Kingsland Road Area);
- *Site Investigation Report*, dated October 29, 2012 (PAP-00203487) (Kingsland Road Area);
- *Baseline Ecological Evaluation, ITT Avionics Division*, dated July 1, 2004 (PAP-00204912) (Facility-wide).

Soil**Kingsland Road Area**

According to a *Preliminary Assessment and Site Investigation Report*, dated June 26, 2012, during visual inspection of transformers and switchgear conducted at the Kingsland Road Area in May 1996, three transformers were identified as having stains on concrete pads adjacent to the transformers. Concrete chip samples were collected at the stained areas and analyzed for PCBs (PAP-00199564). The maximum detected concentration of total PCBs in concrete chips was 6.24 mg/kg in 1997 (PAP-00200025). The maximum detected concentration of total PCBs in soil below the concrete was 0.054 mg/kg in 1997 (PAP-00200026).

In addition, in 2005, concrete chip samples and wipe samples were collected from the surface of the concrete upon which interior building transformers were historically staged (PAP-00199564). Total PCBs were detected at a maximum concentration of 1,890 µg/kg in concrete chip samples from an interior floor (PAP-00199591). It is reported that

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all concrete core bottom sample and soil sample data were reported as non-detected for PCBs (PAP-00199585; PAP-00203490). According to a *Site Investigation Report*, dated October 29, 2012, based on these results, no further investigation was recommended for soil in proximity to the building transformer areas (PAP-00203490).

Washington Avenue Area

According to a *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, a former dry well near the 500 Washington Avenue facility was considered a potential concern because it may have received plating or acid wastes (PAP-00205108). High and low molecular weight PAHs were identified in soil associated with the dry well (PAP-00205108, 136). Mercury, copper, and lead were detected at concentrations of 0.83 mg/kg, 52.1 mg/kg, and 57.6 mg/kg, respectively, at a depth of three to four feet (PAP-00205137).

River Road Area

According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, a discharge from a machine shop sink in the building was released via a pipe directly to a subsurface dry well on the north side of the building (PAP-00199292, 89). In addition, a former dry well for plating rinse water was located at the northeast corner of the building (PAP-00199293). Finally, a former dry well for non-contact cooling water was located at the northeast corner of the building (PAP-00199289). It is noted that according to a *Remedial Action Report*, dated February 1997, facility personnel stated that the non-contact cooling water dry well did not receive industrial waste, but rather was a discharge point for storm water (roof drains), further corroborating that the metals detections in the dry well were related to the recognized historic fill. (PAP-00203004).

It is noted that initially, the eastern portion of the River Road Area was reportedly landfilled with municipal refuse immediately prior to construction of the facility, prior to ITT's ownership of the property. It is reported that there are no records regarding the period of landfill activity, the types of waste disposed, or the manner of landfill closure, but that on-site drilling has revealed fill material to include coal, ash, glass, china, leather, rubber, cast iron, and steel (PAP-00199213). Later, additional evidence provided to NJDEP showed that the fill that predated ITT's ownership extended to almost the entire River Road Area. NJDEP itself concurred with the conclusion that fill "extends throughout the site..." in a letter dated August 31, 1994 (PAP-00202983). Metals detected in this area were attributed to former landfill activities (PAP-00199291). The NJDEP concurred that this area was historic fill (PAP-00202983).

Maximum detected concentrations of mercury, copper, and lead detected in 1991 and 1993 at of the above-listed areas were as follows (PAP-00199290-293, 312, 316-317):

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Maximum Metals Concentrations by Area of Concern (mg/kg)				
COC	Machine Shop Sink Discharge	Dry Well for Non-Contact Cooling Water	Dry Well for Plating Rinse Water	Municipal Landfill
Mercury	2.1 (at 0.5 to one foot)	Not Detected	Not Detected	Not Detected
Copper	2,380 (at 0.5 to one foot)	360 (at one to three feet)	360 (at one to three feet)	865 (at zero to two feet)
Lead	1,400 (at two to four feet)	2,470 (at one to three feet)	2,470 (at one to three feet)	1,710 (at zero to two feet)

Remedial Activities

In 1989, ITT initiated an investigation of environmental conditions at the site as part of a corporate-wide environmental assessment of all ITT properties (PAP-00203472; 77). ITT participated in New Jersey's Voluntary Cleanup Program and entered into three Memoranda of Agreement with NJDEP for the investigation and remediation of the three separate areas of the site in 1993 (PAP-00203454-69).

Kingsland Road Area

According to a *Preliminary Assessment and Site Investigation Report*, dated June 26, 2012, six USTs, identified as UST systems E1 through E6, were closed and removed from the northern side of the Kingsland Road Area site, north of the former boiler house between July 12, 1990, and October 25, 1990. UST systems E1 through E4 were 22,000 gallons in capacity and were used for the storage of No. 6 fuel oil. UST systems E5 and E6 were 2,000 and 6,000 gallons in capacity, respectively, and were used for the storage of No. 4 fuel oil. Four post-excavation soil samples were analyzed for PAHs, and according to the report, no further action was required (PAP-00199804-05, PAP-00199883).

Beginning in 1985, PCB-containing transformers were retro-filled and retested until concentrations were below 50 parts per million (ppm) and PCB-impacted concrete was removed from the facility in 2005 (PAP-00199564; PAP-00203490).

The Kingsland Road Area received an "Unrestricted Use (Soils Only) No Further Action Letter and Covenant Not to Sue" for soil from NJDEP on June 2, 1998. This designation did not include PCB contamination at the building transformer pads because the investigation was ongoing (PAP-00199578-79; PAP-00026342-43). The *Preliminary Assessment and Site Investigation Report*, dated June 26, 2012, states that this "no further action" designation applied to the above-referenced USTs as well (PAP-00199558). It is reported that a "no further action" letter was not issued for the transformer pads because the investigation was ongoing (PAP-00199572).

Additional sampling work was performed in 2005 (PAP-00203490). A New Jersey Licensed Site Remediation Professional determined that no further remedial action was required for the transformer pads on November 19, 2012 and issued a Response Action Outcome (PAP-00026345-53).

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Facility Data ReportWashington Avenue Area

According to a *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, a former dry well near the 500 Washington Avenue facility was considered a potential concern because it may have received plating or acid wastes (PAP-00205108). Affected subsurface soils were removed in 1993 and confirmation samples were collected (PAP-00200077-80; PAP-00199293).

According to a *Site Evaluation Submission and Cleanup Plan Report*, dated July 1993, a 20,000-gallon heating oil UST and a 3,000-gallon heating oil UST located at the 500 Washington Avenue facility were identified by ITT's environmental consultant as an area of potential concern because of the age of the tanks. The USTs were removed under NJDEP oversight in 1990. Post-excavation soil samples were collected (PAP-00205103). According to the report, although there was one sample that exceeded the NJDEP action limit for total base neutral compounds, "the sample depths and the sound condition of the tank system suggest that the elevated contaminant levels may be attributed to historical conditions (i.e. construction fill material) unrelated to the UST system operation." (PAP-00202323).

In addition, an *Underground Storage Tank Closure Plan Implementation Summary Report* was prepared for ITT in March 1993. This closure plan addressed the decommissioning of two USTs at 390 Washington Avenue and one UST at 417 River Road. The USTs at 390 Washington Avenue were a 10,000-gallon No. 4 fuel oil tank and a 10,000-gallon No. 2 fuel oil tank. The UST at 417 River Road was a 3,000-gallon No. 2 fuel oil tank. The USTs were removed under NJDEP oversight and post-excavation samples were collected (PAP-00205094-95). The two tanks at 390 Washington Avenue were intact with no signs of leaking (PAP-00205106-08). Similarly, the UST at 417 River Road did not show signs of leaking (PAP-00205105). NJDEP issued a "no further action" designation for the Washington Avenue Area on July 31, 1995 (PAP-00204398; PAP-00204388).

River Road Area

According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, between October 31, 1990 and November 2, 1990, a 20,000-gallon UST system used to store No. 2 fuel oil was evacuated of its contents, excavated and removed in accordance with an NJDEP-approved UST closure plan. Post-excavation samples were collected. High and low molecular weight PAHs were detected. The report states that based on the analytical results and a no further action letter received from NJDEP, no further action was proposed (PAP-00199288, 315). On July 13, 1992, NJDEP issued a letter stating that no additional corrective action related to the USTs at the River Road Area was needed (PAP-00199231).

According to a *Site Evaluation Submission and Remedial Action Plan*, dated October 1993, a discharge from a machine shop sink in the building was released via a pipe directly to a subsurface dry well in the ground on the north side of the building (PAP-00199292). Subsurface soil sampling in the area of the machine shop sink surface discharge identified copper and lead (PAP-00199279, 292). The machine shop sink dry

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well and associated subsurface soils were excavated and disposed of off-site (PAP-00199293). NJDEP stated that this area should be restricted to non-residential use based on a single sampling result that exceeded the residential direct contact soil cleanup criteria for lead (PAP-00203066, PAP-00202984).

According to a *Remedial Action Report*, dated February 1997, in 1995, ITT excavated soil containing lead from the area of the municipal landfill, which included the former plating, rinse water dry well and the non-contact cooling dry well. Approximately 5.4 (3.6 + 0.6 + 1.2) cubic yards of soil was removed (PAP-00203019, 22-23). Lead remained in subsurface soil following the excavations at a concentration as high as 598 ppm (PAP-00203029). According to the report, this area also included the former dry well for plating rinse water, and the non-contact cooling water dry well and lead detected in these areas was attributed to historic fill (PAP-00203036).

NJDEP issued a “no further action” designation for all areas of the River Road Area on November 18, 1997. A “Declaration of Environmental Restriction” was required for the municipal landfill area because of exceedances of zinc, which is not a COC (PAP-00204414, PAP-00203100). The deed notice was terminated on July 15, 2015 (PAP-00382267).

8. Summary of Asserted Defenses

ITT believes that its operations at the Facility did not result in a discharge or release of COCs to the Third River or the Passaic River, or to OU 2. However, to the extent an allocation to ITT is based on discharges to the PVSC or stormwater discharges, these discharges of copper and lead to the PVSC were permitted discharges conducted in compliance with federal and state permit conditions, and thus are exempt under CERCLA. In addition, PAHs contained in petroleum products that came from tanks or associated piping in subsurface soils are subject to the petroleum exclusion under CERCLA.... [A]lthough ITT asserts that it is not liable for the conditions in the LPR [Lower Passaic River], if it is determined to have any liability, ITT has already contributed more than its fair share to response costs.... ITT cannot be liable for or be required to pay for a release that arises out of conduct lawfully undertaken in compliance with permits or other approvals issued by relevant government agencies, including the States and/or the United States and/or in compliance with applicable laws, regulations, rules, orders, ordinances, directives and common law (‘applicable Environmental Laws’). It is constitutionally impermissible to impose retroactive liability for acts that were previously authorized or condoned by law including applicable Environmental Laws. At all relevant times, ITT complied with all applicable Environmental Laws, regulations, industry standards and ordinances, and otherwise conducted itself reasonably, prudently, in good faith and with due care. ITT exercised due care with respect to hazardous substances, if any, that may have been handled at the Facility, took precautions against foreseeable acts or omissions of others and the consequences that could reasonably result from such acts or omissions, and because any release or threat of release of any hazardous substances, if any, and costs arising therefrom were caused solely by the negligence, acts or omissions of third parties over whom ITT had no control.

Hartz Consumer Group, Inc.

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Facility Data Report**Hartz Consumer Group, Inc.**

Facility Name, Address and Size: The Hartz Mountain Corporation Site, owned by the Hartz Consumer Group Inc./Hartz Mountain Corporation (Hartz); 600/700 Frank E. Rodgers Boulevard (formerly South 4th Street), Harrison, New Jersey; 10.3 acres (PAP-00216527); 550 employees, 1 shift per day, 5 days per week (PAS-00002440). Another source says 770 employees, up to 3 shifts per day in some areas, 251 days per year (PAS-00002444).

1. Business Type: Pet products and supplies (PAS-00002440)

2. Time Period of Ownership/Operations

Operator: Hartz Mountain Corporation 1971 to 1996

Owner: Sternco-Dominion Real Estate Corporation December 11, 1970 to September 15, 1999

1895: Hyatt Roller Bearing Facility operated independently at the property before being acquired by General Motors (GM) (PAS-00124165; PAS-00125353). Hyatt Roller Bearing Company operating on-site from 1897 and was acquired by GM in 1918 (PAP-00005292), but other sources identify Reuther Bros Foundry and other industrial uses prior to 1918 (PAS-00002123).

1918: General Motors-Hyatt Roller Bearing Facility was the previous site owner and operator (PAS-00002123). GM began operations providing roller bearings, and the manufacturing process included machining, heat treating, bearing assembly and fabrication, and recovery of machining fluid and scrap. Waste materials generated included hydraulic, lubricating, and soluble oils, scrap metal shavings/chips, off-specification products, and sludge from grinding solutions (PAP-00005292). Operations at this property were phased out between 1966 and 1968 (PAP-00005292).

1970: Hartz operated the site from 1971 until 1993, when operations ceased. Other sources state that Sternco Dominion Real Estate Corp. purchased the property on December 11, 1970 and leased it to Sternco Industries, Inc. on August 19, 1971. The lease expired in 1991 and the tenancy continued month to month until the property was vacated in 1995 (PAP-00211208; PAP-00005292-93). However, correspondence regarding the property purchase were addressed from Hartz Mountain Products Corp. (PAP-00211220-21).

1973: Sternco Industries, Inc. merged with Hartz Mountain Pet Foods, Inc. on May 31, 1973, and the name was changed to Hartz Mountain Corporation (PAP-00165391; PAP-00211207-8).

1995: Property vacant after transfer of warehouse operations (PAP-00216533).

1999: The site was sold to FER Boulevard Realty Corp. in 1999 (PAP-00005354; PAP-00216533; PAS-00002123).

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- 2000: Hartz was jointly purchased by the company's management and an investment group named J.W. Childs (PAP-00165391).
- 2004: Hartz was acquired by Sumitomo Corporation of America in September 2004 (PAP-00165391; PAS-00125317).
- 2011: Property taken by Harrison Redevelopment Agency (HRA) via eminent domain in June 2011 (PAP-00006537; PAP-00216533).
- 2012: All buildings demolished under ownership of HRA (PAP-00216533).
- 2015: Title transferred from HRA to Heller Urban Renewal, LLC (Heller) (PAP-00216533).

3. Operational History/COC Use and Presence at the Facility

Buildings 0 through 9 were present at the site during operations by Hartz. Buildings 0 through 9 were constructed between 1910 and 1954, during ownership/operations by GM (PAP-00210588). The property is bound to the north, south, and east by active railroad easements (Conrail and Amtrak), and bound to the west by the former South 4th Street (now Frank E. Rodgers Boulevard). Approximately 90 percent of the property was impervious surfaces. Two large building complexes were separated by a central roadway (Middlesex Street). Building 1 was located south of Middlesex Street, was approximately 80,000 square feet, and contained offices, warehouses, plant utilities (heating plant, fire cistern, pumping station), and a rooftop parking deck. Buildings 0 and 2 through 9 were located north of Middlesex Street, and contained assembly, lab, and office areas. The buildings to the north totaled approximately 190,000 square feet (PAS-00121274; PAS-00123454). A map of the building locations is presented below (PAP-00216586):



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When the property was purchased by Hartz, the buildings were in a state of disrepair as the facility had not been used for years (PAP-00211059, 65-67). The pit furnaces left by GM in Building 9 were removed by Hartz in 1971 (PAP-00211061-62, 209). Two 30,000 gallon fuel oil aboveground storage tanks (ASTs) located east of Building 8 were moved to the east end of Building 1 (PAP-00211208-09).

Hartz Consumer Group operations consisted of the following:

- Packaging of fish food, charcoal, and aquarium gravel on the third floor of Building 7, from 1971 to 1982 (PAP-00210605);
- Blister packaging on the third floor of Building 7 from the early 1970s to 1982 (PAP-00210605);
- Aquarium operations (steel/glass) at Buildings 3 and 4 at grade level from the early to late 1970s (PAP-00210605);
- Aquarium operations (all-glass) at Buildings 3 and 4 at grade level from the late 1970s to early 1990s (PAP-00210605);
- Display rack assembly, including powder painting and vapor degreasing in the basement of Building 0, from 1972 to the early 1990s (PAP-00210605);
- Shipping at Buildings 1 and 8, from the early 1970s to 1995 (PAP-00210605)
- "Carpet Magic" machine maintenance and repair on the first floor of Buildings 3 and 4 from the late 1970s to early 1990s (PAP-00210605);
- Research and Development (R&D) Laboratories at Buildings 4, 5, and 6 from 1975 to 1995 (PAP-00210605); and
- Warehousing throughout the facility from the early 1970s to 1995 or 1996 (PAP-00210605).

During production of stainless steel aquariums in Buildings 3 and 4, tar was heated in a tank and wax was added until the mixture was in a flowing state. This occurred on the first floor of the buildings (PAP-00211114). A tank on the second floor of the building was used to store tar and gravity fed the tar to the first floor (PAP-00211114-15). Residual tar from the day was left in the tank and re-heated the next day for use (PAP-00211115). Tar was purchased in corrugated-wrapped 50 pounds logs, stored on pallets (PAP-00211118). The tar AST on the second floor was a 3,000 gallon AST, but was removed in 1989 (PAP-00211210).

Small quantities of COC-containing compounds (copper, mercury, and lead) were used and stored in small bottles at the R&D laboratories in Buildings 4, 5 and 6 (PAP-00210638). The R&D laboratory only used and/or stored very small quantities of chemicals and used only gram amounts or less for any experiments. Materials were poured down the laboratory sink, which was connected to the sewer system. The daily flow of water discharged by the Hartz facility was 13,000 gallons per day (PAS-00048703). Other sources state that waste materials from the laboratory were not poured down the sink drains, but were instead collected and placed in lab packs for off-site disposal (PAP-00210638).

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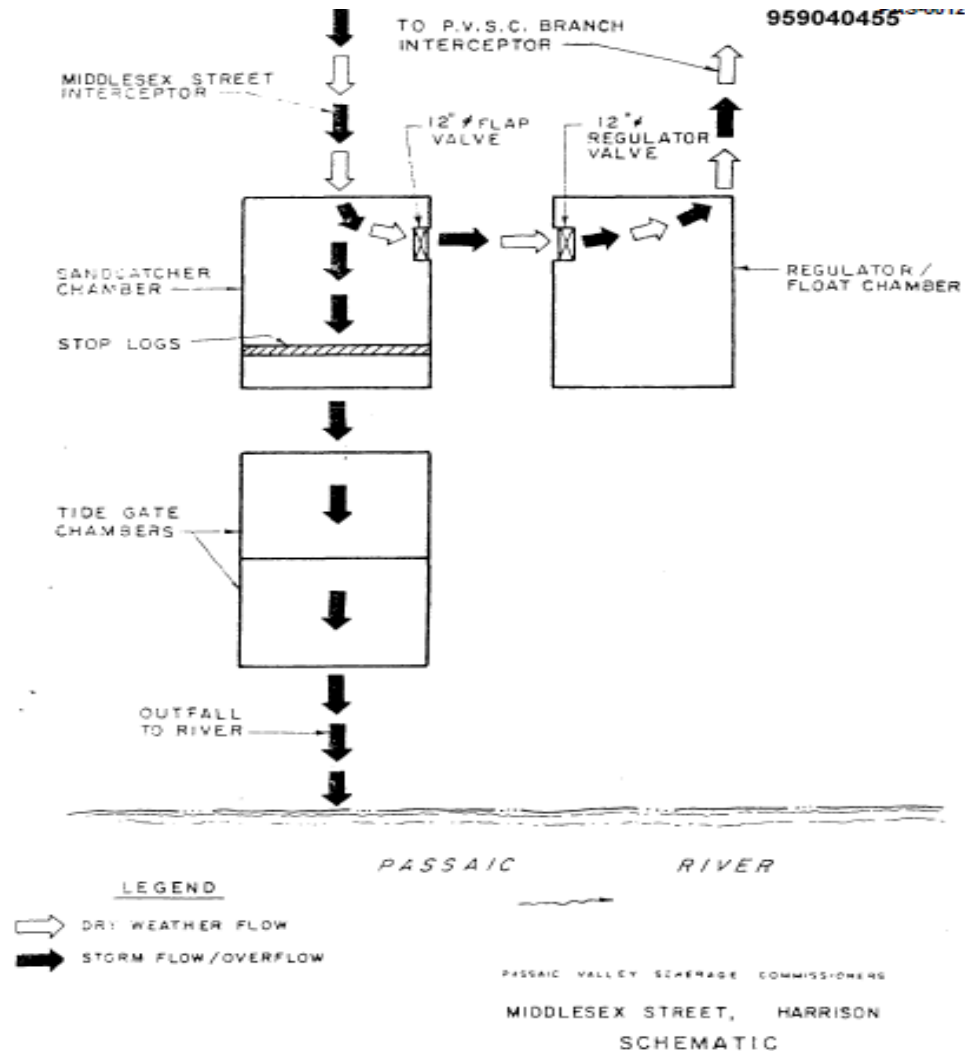
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Equipment used to manufacture pet food was washed down at the end of the work day using hot water and the rinse water was discharged to the sewer (PAP-00211108). Dry waste was placed in compactors in Building 7 (PAP-00211112). Stainless steel scrap was collected in drums and taken by scavengers (sometimes Hartz was paid, other times they had to pay, depending on the scrap metal market) (PAP-00211124).

Hartz did not use several areas of the site where COCs were found, including the subsurface tunnels and the chip pit (PAP-00210606). Equipment left by GM but not used by Hartz included a kerosene tank at Building 8, three rectangular steel tanks in a subsurface processing room, and two hot water tanks in the Building 5 pump room (PAP-00211209).

A schematic of the Middlesex Street combined sewer system is presented below (PAS-00121700):



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Facility Data Report**4. Identified COCs**

- PCBs (detected)
- PAHs (used, detected)
- Copper (used, detected)
- Lead (used, detected)
- Mercury (used, detected)

PCBs

Except for transformers owned by others, there were no operations or processes used by Hartz that used or contained PCBs. GM used PCBs in their manufacturing process as high temperature hydraulic fluid (PAP-00210552).

GM purchased approximately 250,000 lbs of Pydraul F-9 (48 to 53% PCBs) from Monsanto (PAP-00210580, 89). GM also purchased approximately 25,000 lbs of Pydraul A-200 (99% PCBs) hydraulic fluids from Monsanto (PAP-00210589). Other sources specify 249,250 lbs of Pydraul F-9 and 26,610 lbs of Pydraul A-200 from Monsanto between 1958 and 1963, with the Pydraul F09 consisting of 48% Aroclor 1248 and the Pydraul A-200 consisting of 66% Aroclor 1248 and 33% Aroclor 1242 (PAP-00005297-98).

Transformers located at the property and owned by Public Service Electric and Gas (PSE&G) did not contain PCBs (PAS-00048701).

PCBs contained in transformers and capacitors owned by Hartz were properly disposed of in 1990 and 1995 (PAP-00210649).

See Section 7, Characterization Activities, for environmental media sampling and detection information for PCBs.

PAHs

Tar used in aquarium assembly operations during the early to late 1970s likely contained PAHs. Tar was originally formulated on-site, but later arrived on-site as asphalt (PAP-00211114-16).

The list of chemicals used by the R&D laboratory contained a substance called coal tar solution topical, which contains PAHs, but the release of these solutions to the laboratory sink, if it occurred, would not be an amount that would be measurable once diluted in the sewer (PAP-00210551-52).

Copper

Copper-containing chemicals used in the R&D laboratory included hampene 14.5% copper, hampene 7.5% copper, and cupric sulfate, which are all water soluble substances (PAP-00210552-53).

See Section 7, Characterization Activities, for environmental media sampling and detection information for copper.

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Lead-containing compounds would have been received in small bottles or jars. Residual laboratory chemicals were placed in lab packs and sent off-site for disposal in accordance with applicable waste management (PAP-00210638).

Lead IV oxide was listed as a R&D laboratory chemical; because this compound is insoluble it would not be poured down the laboratory sink if appropriate laboratory practices were followed (PAP-00210553).

See Section 7, Characterization Activities, for environmental media sampling and detection information for lead.

Mercury

Colloidal mercury was listed as a chemical used in the R&D laboratory (PAP-00210552).

See Section 7, Characterization Activities, for environmental media sampling and detection information for mercury.

Historic Fill

The Allocation Team has determined that the property is not located on regional Historic Fill as designated by the NJDEP.¹

However, historic fill, including brick, cinders, weathered concrete, discarded metal pieces, and other indications of historic fill were identified in soil borings advanced across the property (PAP-00216377).

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.² Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.³ PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.⁴

¹ *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, <https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm>, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

² *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

³ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

⁴ NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill state that

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COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	6,400 mg/kg
Copper	4,100 mg/kg
Mercury	3.2 mg/kg
Benzo(a)anthracene	0.57 mg/kg
Benzo(a)pyrene	0.82 mg/kg
Benzo(b)fluoranthene	1.2 mg/kg
Benzo(k)fluoranthene	0.33 mg/kg
Dibenzo(a,h)anthracene	0.14 mg/kg
Indeno(1,2,3-cd)pyrene	0.57 mg/kg

The *Remedial Action Workplan for Heller Redevelopment Parcel/Hub at Harrison Station, Former Hartz Mountain Corporation Site*, dated June 2018, includes several cross-section figures that depict the presence of fill, ranging in thickness from 2 to 10 feet (PAP-00216606-13).

5. COC Pathways***Sanitary and Storm Sewer***

During 1974, the facility received 3,285,515.2 gallons of water; no well water or river water was used by the facility (PAS-00002441). Water was purchased from the Harrison Water Department (PAS-00002445). All the water used was discharged to the sanitary sewer and a sample of the discharge water was collected over a 10-hour period on February 4, 1976 (PAS-00002441-42). No specifics regarding COCs were provided in available references and it is unknown if the sample was analyzed for COCs.

Cooling water was discharged directly to the sewer system as of May 24, 1988, and a closed, non-contact cooling water system was installed in January 1989 (PAP-00165392; PAP-00210498). The non-contact cooling water system was in operation as of April 1989 (PAP-00210499).

Documented wastewater discharge volumes are as follows:

- According to a *Waste Effluent Survey* dated June 27, 1972, 11,290,000 gallons of wastewater were discharged to the sanitary sewer in 1971 (PAP-00210437-38; PAS-00125321).
- According to a *Waste Effluent Survey* dated November 24, 1975, 328,551.52 gallons of wastewater were discharged to the sanitary sewer in 1974 (PAP-00210445-46).

the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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- According to a *Waste Effluent Survey* dated March 30, 1976, 3,285,515.2 gallons of wastewater were discharged to the sanitary sewer in 1974 (PAP-00210447-48; PAS-00002441-42).
- According to an Application for a Sewer Connection Permit to the Passaic Valley, 9,664,160 gallons of wastewater were discharged to the sanitary sewer in 1985, of which 3,865,400 gallons were from sanitary service only and 5,798,760 gallons were cooling water (PAS-00002445). Sample results of the waste water taken at three outlets on June 18, 1986 include lead from <0.1 to 0.3 ppb, mercury at <0.002 ppb, and pesticides at <1 ppb (PAS-00002450-53).
- According to a letter dated June 2, 1995 and a follow-up letter dated June 27 1995, a request was made to PVSC for approval to discharge 34,000 gallons of pre-treated water to the combined sewer system. The water was generated during sediment removal from the on-site sewers (approximately 25,000 gallons) and dewatering of an on-site tunnel (approximately 15,000 gallons). Sample results state that post-treatment concentrations were as follows: copper <25 micrograms per liter (µg/L), lead <3.0 µg/L, mercury <0.20 µg/L, total PCBs 0.55 µg/L (PAP-00008294; PAP-00008323-25). According to a letter dated July 18, 1995, 20,000 gallons were approved by PVSC and was discharged to the combined sewer system on July 3, 1995. The July letter also requested approval to discharge 10,000 gallons of water to the combined sewer system from an on-site tunnel (PAP-00008334).
- According to a letter dated November 9, 1995, a request was made to PVSC to discharge 7,000 to 10,000 gallons of pre-treated monitoring well development water to the combined sewer system (PAP-00008358).

Direct Release

According to the *Lower Passaic River Study Area PRP Data Extraction Form - Hartz Mountain Corp./Sternco Industries, Inc. and the Maxus Energy Corporations and Tierra Solutions, Inc.'s Third-Party Complaint "B"*, PVSC reports state that during rainfall or wet weather, a portion of the combined flow in the Middlesex Street combined sewer outfall (CSO) entered the interceptor, with the balance of the combined flow being discharged via the outfall pipe to the Passaic River (PAP-00165392; PAS-00125327).

Spills

A PVSC *Stream Contamination Report Violation Elimination* report, dated October 5, 1981, states on September 29, 1981, a leak was discovered in the No. 2 oil storage tank during a boiler start up. Approximately 500 gallons of No. 2 oil was released before the valve was shut off. Hartz contacted the Coast Guard and NJDEP immediately and retained Moran-Crowley Service to clean up the spill. Water from the storm outlet was collected and pumped into a tank truck to prevent discharge to the river and booms were placed around the outlet and downstream. The Coast Guard and NJDEP were checking daily on the cleanup and the river inspector stated that PVSC involvement would not be needed (PAS-00002462-63). It should be noted that the address on the PVSC *Stream*

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Contamination Report Violation Elimination report, dated October 5, 1981 is 1000 First Street, which is not the location of the Hartz facility. Hartz states they never owned nor operated at the 1000 First Street property, and therefore is not responsible for this spill (PAP-00210639-40; PAS-00048701). Hartz Harrison Limited Partnership was the owner of the 1000 First Street property, after purchasing this property from Otis Elevator Company in December 1980. Hartz Harrison Limited Partnership was an affiliate of Hartz Mountain Industries, Inc. (HMI), a real estate development and management company (PAP-00210640). It should be noted that Hartz and HMI were sister companies (privately owned but separately managed) for a period of time until 2000, when Hartz was sold to a third party (PAP-00210640).

6. Regulatory History/Enforcement Actions***Inspections***

NJDEP conducted a preliminary ISRA inspection on June 30, 1993. Staining of the concrete around the transformers was observed (PAP-00007551).

Violations

There is no information regarding violations in the available file material.

Permits

According to the *Lower Passaic River Study Area PRP Data Extraction Form - Hartz Mountain Corp./Sternco Industries, Inc.*, Hartz did not have a PVSC-issued wastewater discharge permit prior to or as of 1985 (PAS-00125322). There are no citations or available underlying documents to support these statements. A letter from Hartz to PVSC dated March 12, 1986, states that an application for a sewer connection permit was submitted (PAP-00210461). However, the permit was not located in the available file materials.

According to the *NJDEP ECRA Initial Notice Site Evaluation Submission (SES)*, dated March 29, 1993, Hartz did not have a NJPDES permit. Hartz did have permits from the New Jersey Bureau of Air Pollution Control for stack discharge from the Hudson Regional Health Commission for air and hazardous waste generation (PAP-00007282).

NJDEP issued a soil remedial action permit to Hartz Mountain Corp. effective March 11, 2020, requiring the permittee to conduct monitoring, maintenance and evaluation for compliance and effectiveness of the remedial action and its associated institutional control, as specified in a deed notice dated February 21, 2019 (PAP-00466312-67). The deed notice restricts land use and specifies the placement of engineering controls on an 1,800 square-foot area on Block 133 Lot 1.03 and a 2,950 square-foot area on Block 133 Lot 1.02 to protect the public from contact with PCB-contaminated soils. The area is developed with commercial and residential buildings, road, sidewalks, parking, and landscaping (PAP-00466358).⁵

⁵ This Report was revised to include documents received on May 15, 2020. The additional documents did not change Hartz's previous certification.

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Another deed notice, dated April 20, 2020, requires the owner to obtain another solid remediation permit, and restricts the land use of a 4,500 square-foot area within Block 133 Lot 1.02, near the Port Authority Trans-Hudson Northeast Station House (formerly AOC-10) due to the presence of PCBs (PAP-00466273-304, 6).⁵

7. Response Actions***Characterization Activities***

The following characterization activities have taken place at the facility:

- *Phase I Site Assessment Letter Report*, dated August 30, 1990 (PAP-00007110);
- *Report on UST Closure Plan Implementation for Hartz Mountain Corporation, Vol 1*, dated July 24, 1991 (PAP-00007133);
- *Discharge Investigation and Corrective Action Report for Hartz Mountain Corporation*, dated November 5, 1991 (PAP-00007188);
- *ECRA Sampling Plan, Hartz Mountain Corporation*, dated May 1993 (PAS-00123448);
- *Remedial Investigation Report and Remedial Investigation Workplan*, dated June 1994 (PAS-00123582);
- *Phase II Remedial Investigation Report, Hartz Mountain Corporation*, dated April 1995 (PAP-00008035);
- *Phase III Remedial Investigation Report, Hartz Mountain Corporation, Vol I and II*, dated June 1996 (PAS-00104756; PAP-00008784);
- *Phase IV Remedial Investigation Report, Hartz Mountain Corporation, Vol I and II*, dated December 1997 (PAP-00005048; PAP-00005248);
- *Phase IV Remedial Investigation Report, Hartz Mountain Corporation*, dated December 1997 (PAS-00121518);
- *Remedial Action Workplan for Heller Redevelopment Parcel/Hub at Harrison Station, Former Hartz Mountain Corporation Site*, dated June 2018 (PAP-00216518);
- *Phase V Remedial Investigation Report, Vol I of I*, dated March 2000 (PAP-00005373);
- *Self-Implementing Cleanup & Disposal Plan, Former Hartz Mountain Facility*, dated May 2011 (PAP-00006176);
- *LNAPL Interim Remedial Measures Report, Former Hartz Mountain Corp.*, dated December 2012 (PAP-00006301)
- *Remedial Investigation Report/Remedial Action Report, PCB Soil Remediation (AOC-21), Former Hartz Mountain Facility*, dated January 2016 (PAP-00006417);
- *Supplemental Remedial Action Workplan, Chip Pit (AOC-8), Former Hartz Mountain Facility*, dated May 2016 (PAP-00006533)
- *Memorandum, AOC-8 Former Chip Pit Investigation/Remediation Summary*, dated June 26, 2015 (PAP-00006666);
- *Supplemental Remedial Action Report, Chip Pit Soil Remediation (AOC-8), Former Hartz Mountain Corporation Facility*, dated December 2016 (PAP-00006751); and,

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- *AOC-18 Remedial Investigation Report, Former Hartz Mountain Corporation Site*, dated April 2017 (PAP-00006866).

Sewer

Six stormwater catch basins were assessed, sampled, and cleaned during the Phase I RI and two more stormwater catch basins were assessed, sampled, and cleaned during the Phase III RI (PAS-00104758). The maximum PCB result was from CB-7, at 110 ppm. Other catch basin sample results ranged from 27.4 ppm to 98 ppm. Only CB-4 was sampled for SVOCs, but no SVOCs were detected above regulatory values (PAS-00104759). [Note: concentrations of SVOCs were not identified in the cited document]. Copper results ranged from 6.1 ppm to 1,200 ppm; lead ranged from <11 ppm to 2,400 ppm; and mercury ranged from <0.10 ppm to 2.9 ppm (PAS-00104761). Another source states that sediment samples collected from the combined sewer system had PCB concentrations as high as 78 parts per million (ppm) (PAP-00006623).

Soil

Several investigations were conducted at the property, including five phases of remedial investigation. Both concrete and soil sampling was conducted. Based on data collected during several remedial investigations, concrete samples contained total PCB concentrations as high as 6,800 ppm (PAP-00006195; PAP-00006609). PCB concentrations in soil were as high as 816 ppm (PAP-00006618). Sediment from within the subsurface tunnels had PCB concentrations as high as 1,900 ppm (PAP-00006624).

According to the *Remedial Investigation Report/Remedial Action Report, PCB Soil Remediation (AOC-21), Former Hartz Mountain Facility*, dated January 2016, 47 soil borings were installed within the footprint of Building 3 following demolition, and PCBs exceed 10 ppm at eight locations, with a maximum concentration of 120 ppm. 37 soil borings were installed within the footprint of Building 4 following demolition, and PCBs exceed 10 ppm at three locations, with a maximum concentration of 53 ppm. 121 soil borings were installed within the footprint of Building 9 following demolition, and PCBs exceed 10 ppm at 45 locations, with a maximum concentration of 280 ppm (PAP-00006427-28).

According to the *Memorandum, AOC-8 Former Chip Pit Investigation/Remediation Summary*, dated June 26, 2015, soil sampling occurred at test pits and at soil borings for AOC-8 (Former Chip Pit), and six of the 11 samples had PCB concentrations above 10 milligrams per kilogram (mg/kg), with a maximum concentration of 42.79 mg/kg (PAP-00006671, 87).

Remedial Activities

Three steel gasoline underground storage tanks (USTs) of unknown age were removed in April 1991 and granted closure approval by the NJDEP (C-91-0517). The tanks had capacities of 550 gallons, 1,000 gallons, and 5,000 gallons, and all contained water with sludge. Approximately 200 cubic yards of soil were removed during the UST removals (PAP-00007128-29; PAP-00007136-37, 39-40).

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Two USTs south of Building 8 were removed prior to the ISRA investigation under Case Number 91-04-09-1745 (approval of UST closure granted by NJDEP in letter dated April 30, 1992) (PAP-00216533). A 550-gallon UST for a steam boiler behind Building 7 was removed in 1991 (PAP-00211209-10).

Three 6,200-gallon quench oil ASTs, three 6,200-gallon machine oil ASTs, two 30,000-gallon fuel oil ASTs, and one 6,200-gallon machine oil AST, previously located to the east of Building 8, were removed by 1993. NJDEP issued a No Further Action Determination on November 11, 1996 (PAP-00216374).

During the initial site inspection in 1993, NJDEP identified staining on an active transformer pad that was located in a courtyard north of Building 3. The transformers were determined to be owned by PSE&G, and the pad, transformer, and surrounding building walls were stained, though PSE&G had no records of a spill. A chip sample of concrete collected from a stained area on the transformer pad, along the flow path to an adjacent storm water drain, detected PCBs. The stormwater drain was dye tested, and the results showed the storm water drain was connected to the storm sewer system located within Fourth Street. Steam cleaning the transformer pad to remove mobile residue and chip sampling from the cleaned transformer pad were conducted in 1994. The transformers were removed by PSE&G in 2001 (PAP-00216375).

During the initial site inspection in 1993, NJDEP identified subsurface tunnels beneath Buildings 4 and 9. Sediment in the tunnels was sampled in 1994 and contained PCBs. In 1996, materials from Tunnels A through F were removed and the tunnels were visually inspected; all were in good condition, with the exception of Tunnel D, which had a crack in the floor. The tunnels were removed during building demolition in 2012 (PAP-00216375).

A 1,000 gallon kerosene UST was located beneath the foundation of the eastern portion of Building 8 and this UST was abandoned in place per the January 2, 1995 UST Closure Report, using low-density concrete. NJDEP issued a No Further Action Determination on November 11, 1996. This UST was later removed following demolition of the buildings (PAP-00216374).

A 2,000 gallon diesel UST located beneath the basement floor of Building 2, used as a fuel source for a backup generator, was proposed for closure in place during 1996, after the backup generator was taken out of service. A UST Closure Application was submitted on May 2, 1996 and approved by NJDEP on May 31, 1996. This UST was later removed following demolition of the buildings (PAP-00008505-16; PAP-00216374).

In 1997 a riveted steel 8,000 to 9,000 gallon UST was identified beneath Building 9. The UST contained approximately 40 tons of sand and 3,000 gallons of residual oily liquid. Based on the piping configuration, the UST appeared to be a process flow-through tank. The UST was emptied and cleaned. Three soil samples were collected beneath the UST's centerline and TPHs and PCBs were detected. The UST was filled with cement to grade, and abandoned in place. In 2012, the process UST was excavated and removed as part of the demolition activities. A sample of the concrete from within the UST had PCB concentrations below applicable standards, so the concrete was crushed and reused on site. The UST shell was disposed offsite as PCB-containing material

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(>50 ppm). Following removal of the building foundations and process UST, PCB-and petroleum-contaminated soils were excavated to a depth of 30 feet bgs (PAP-00216376).

Six stormwater catch basins were assessed, sampled, and cleaned during the Phase I RI and two more stormwater catch basins were assessed, sampled, and cleaned during the Phase III RI. Integrity testing was conducted at all catch basins, with the exceptions of CB-1, CB-3, and CB-4. Most of sediments removed were from CB-2 (PAS-00104758). Catch basin CSS-2 was excavated and backfilled and was then no longer functional (PAS-00104760). Approximately 80 tons of PCB contaminated sediment and other debris were removed from the stormwater catch basins/combined sewer (PAS-00121267).

According to the *Self-Implementing Cleanup & Disposal Plan, Former Hartz Mountain Facility*, dated May 2011, concrete impacted by PCBs was washed with PCB cleaning solution until wipe results showed PCB concentrations below 10 µg/cm² (PAP-00006181). This document also states that soil investigations determined that PCB concentrations in soils beneath Buildings 3, 4, and 9 exceeded 10 ppm, to a depth of 12 feet below grade beneath Buildings 3 and 4, and between 28 and 30 feet below grade beneath Building 9 (PAP-00006185). Following PCB cleaning, all buildings were demolished in 2012 for future site redevelopment (PAP-00216533).

According to the *Memorandum, AOC-8 Former Chip Pit Investigation/Remediation Summary*, dated June 26, 2015, excavation with offsite disposal was conducted at AOC-8 (Former Chip Pit) to remediate soil with PCB concentrations above 50 ppm. At the catch basin CB-CSS2 area, excavation with offsite disposal was conducted to remove the catch basin feature and PCB impacts above 10 ppm (PAP-00006672). According to the *Supplemental Remedial Action Workplan, Chip Pit (AOC-8), Former Hartz Mountain Facility*, dated May 2016, 2,000 tons of PCB-contaminated soil were removed from the Chip Pit area (AOC-8) in 2015, but PCB concentrations above 10 mg/kg remained in some areas (PAP-00006539).

According to the *Remedial Investigation Report/Remedial Action Report, PCB Soil Remediation (AOC-21), Former Hartz Mountain Facility*, dated January 2016, all soil and concrete with PCB concentrations greater than 10 ppm was removed and disposed offsite during building demolition, while soils and concrete with PCB concentrations less than 10 ppm were used for re-grading and placed under an on-site cap with a deed notice filed in perpetuity (PAP-00006422). Approximately 19,000 tons of material with PCB concentrations between 10 and 50 ppm and approximately 29,000 tons of material with PCB concentrations greater than 50 ppm were removed and disposed of offsite (PAP-00006435). During soil excavation activities, dewatering occurred, which include the removal of 10,559,339 gallons of water, which was treated for total suspended solids, PCBs, and volatiles, prior to discharge to the sewer, under a PVSC permit (the permit was referenced to be in Appendix E of the cited document, but this appendix was not included in the file materials) (PAP-00006432).

Hartz Consumer Group, Inc.

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According to the *Supplemental Remedial Action Report, Chip Pit Soil Remediation (AOC-8), Former Hartz Mountain Corporation Facility*, dated December 2016, “hot spot” excavation occurred on July 5, 2016 to remove PCB concentrations greater than 50 ppm to a depth of 10 feet below ground surface (bgs) at AOC-8. July 6-13, 2016, “warm spot” excavation occurred to remove PCB concentrations greater than 10 ppm, but less than 50 ppm at AOC-8. Approximately 245 tons of “hot spot” soil and approximately 2,100 tons of “warm spot” soil were removed. Approximately 30 tons of concrete removed from the subsurface adjacent to AOC-8 was analyzed and disposed of offsite (PAP-00006760-62).

According to a NJDEP Confirmed Discharge Notification Form submitted on October 4, 2017, a 3,000-gallon UST was uncovered during site redevelopment, near the southwest corner of former Building 7. The UST was registered and removed on August 17, 2017. Soil samples were collected and PCBs exceed 10 mg/kg. Delineation occurred between October 2017 and February 2018 and PCBs greater than 10 mg/kg were excavated (PAP-00006990-92; PAP-00216377).

According to a PCB Impacted Soil and Liquids Disposal Summary, dated May 7, 2020, a total of 36,095 tons of soil with >50 ppm PCBs and 27,707 tons of soil with <50ppm PCBs were disposed of from the site between 1995 and 2018 (PAP-00466272).⁶

8. Summary of Asserted Defenses

Hartz and its consultants and remediation contractors are “response action contractors” protected under §119(a) of CERCLA. They are thus protected from liability in connection with any incidental discharges or releases during its remediation of (GM-Hyatt’s) contamination in cleaning up the Harrison Site. This is consistent with the law of the Third Circuit (See *U.S. v. CMDG Realty Co.*, 96 F.3d 706 (3d Cir. 1996) (requiring a showing that contractor negligence exacerbated contamination before a remediation contractor would be subject to “operator” liability). Hartz also claims “innocent landowner” status, having done the appropriate level of due diligence when it acquired the site in 1970. See 42 U.S.C. §9601(35). Remediation of petroleum hydrocarbons may also be covered by the CERCLA “petroleum exclusion” See 42 U.S.C. §9601(14).

⁶ This Report was revised to include documents received on May 15, 2020. The additional documents did not change The Hartz Mountain Corporation’s previous certification.

Hexcel Corporation

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Facility Data Report**HEXCEL CORPORATION**

Facility Name, Address and Size: Hexcel Corporation (Hexcel), 205 Main Street, Lodi, New Jersey. The site is an approximately two-acre parcel (PAS-00002498). According to an *Application for a Sewer Connection Permit*, dated July 9, 1985, Hexcel had 39 full-time employees that worked one shift per day, 260 days per year (PAP-00326658, 68).

1. **Business Type:** Manufacturer of specialty chemicals and industrial cleaning compounds (PAS-00091294; PAS-00091237).
2. **Time Period of Ownership/Operations**

Operator: Hexcel Corporation (1973-1986)
Fine Organics, Inc. (1944-1973)

Owner: Hexcel Corporation (1973-1986) and (1998-2017)

According to an Environmental Cleanup Responsibility Act (ECRA) General Information Submission from January 7, 1986, Hexcel Industrial Chemicals Group, a subdivision of Hexcel Corporation, had been operating at the site, but the property was in the process of being sold to FOA Corporation of Wyckoff, New Jersey. Hexcel Corporation of San Francisco, California, was identified as the owner of the property prior to the sale, which was anticipated to be finalized on January 29, 1986. The form states that Hexcel operated at the site starting in 1973 when it merged with Fine Organics, Inc. Fine Organics, Inc. manufactured specialty chemicals and had owned and operated the site since 1944. United Piece Dye Works operated at the site manufacturing dyestuffs for the textile industry from the early 1900s to 1944 (PAS-00091293-95).

A letter dated April 5, 1991, from Fine Organics Corporation states they purchased the facility from Hexcel Corporation on April 1, 1986, suggesting that FOA Corporation had changed their name to Fine Organics Corporation (PAS-00089207).

A Remedial Action Work Plan (RAWP) Addendum, dated November 1999 states the facility had been sold to Fine Organics Corporation in 1985, who operated at the facility until September 1998. Once Fine Organics Corporation was removed from the site, Hexcel demolished the buildings to improve accessibility for remediation of the site. The RAWP Addendum identified Hexcel Corporation as the owner of the site at that time (PAS-00002491, 96).

According to a Remediation Agreement between Hexcel and the New Jersey Department of Environmental Protection (NJDEP), signed in April 1997, Hexcel would purchase the property from Fine Organics Corporation. Hexcel agreed to remediate the site under the NJDEP Industrial Site Recovery Act (ISRA) (PAP-00047398-405).

3. **Operational History/COC Use and Presence at the Facility**

According to a 1986 Inspection Report by NJDEP, Hexcel manufactured, blended, and packaged industrial cleaning compounds. They also produced certain resins, but the report stated this was expected to be phased out by January 30, 1986. The Inspection

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Report also stated that different chemical manufacturing operations have occupied the site for more than 80 years (PAS-00091237).

The *Application for ECRA Review, Initial Notice, Site Evaluation Submission*, dated January 14, 1986 (the 1986 SES), stated manufacturing of industrial cleaning compounds occurred in Buildings Nos. 1, 11, and 12 and under the canopy east of Building No. 1. Raw materials were blended in 17 mixing tanks that ranged in size from 50 to 7,500 gallons. The blending process did not produce hazardous wastes as by-products. However, any off-spec product or finished product not marketed was disposed as hazardous waste if appropriate. Wastewater (from wash-outs and cooling water) was discharged to the Passaic Valley Sewerage Commission (PVSC) system under permit and monitored by a 24-hour sampling device. The yard adjacent to the Saddle River was paved in 1963 and used as an outside drum storage area for raw, work-in-process, and waste materials, according to the 1986 SES. Spill containment curbs were installed in the drum storage area along Saddle Brook in 1980 and 1981. The portion east of Building No. 2 has been used for outside storage of finished industrial maintenance chemicals (PAP-00326360, 63, 65-67, 70).

As reported in the Investigation of Fuel Oil Leak for Hexcel, Lodi, New Jersey, dated June 1984, investigation at the site began in 1984 in response to leaking fuel oil underground storage tanks (USTs). Fuel oil was found to be in the soil and gravel surrounding the USTs from depths of 0.5 to 8 feet below ground surface (ft bgs) and at least 10 feet away from the USTs (PAS-00091704, 16). It was suspected that two USTs had been leaking fuel oil for years. During the subsequent investigation, analysis of an oil sample collected from a nearby existing recovery well detected polychlorinated biphenyls (PCBs) at 43 parts per million (ppm) (PAS-00091430, 39). Lead was also detected at low levels (96 and 130 ppm) in soil samples from the site, but according to the report on the Investigation of Fuel Oil Leak for Hexcel, lead had never been used or stored onsite (PAS-00091426, 36-37).

It was stated in the *Summary Report of Preliminary Environmental Sampling*, dated October 14, 1987, that PCBs were not used as part of the ongoing operations of the facility (PAS-00091023, 52). However, according to the *Presentation of the ECRA Sampling Results for Hexcel Corporation*, dated December 1988, PCBs had been used in the heat exchange system of Building No. 1, which was not in operation at that time (PAS-00090284). Investigation of the decommissioned heating oil system, overhead wooden flooring in the boiler room, and subsurface concrete pits beneath the boilers detected PCBs up to 5,500 milligrams per kilogram (mg/kg). PCBs were also found in oil in the industrial sewer system, specifically catch basin CB8 and manhole M1 (PAS-00091037-38).

A list of Manufacturing Equipment from 1969 includes a reactor with a hot Therminol® heating system (PAP-00326349). Therminol® would have contained PCBs.

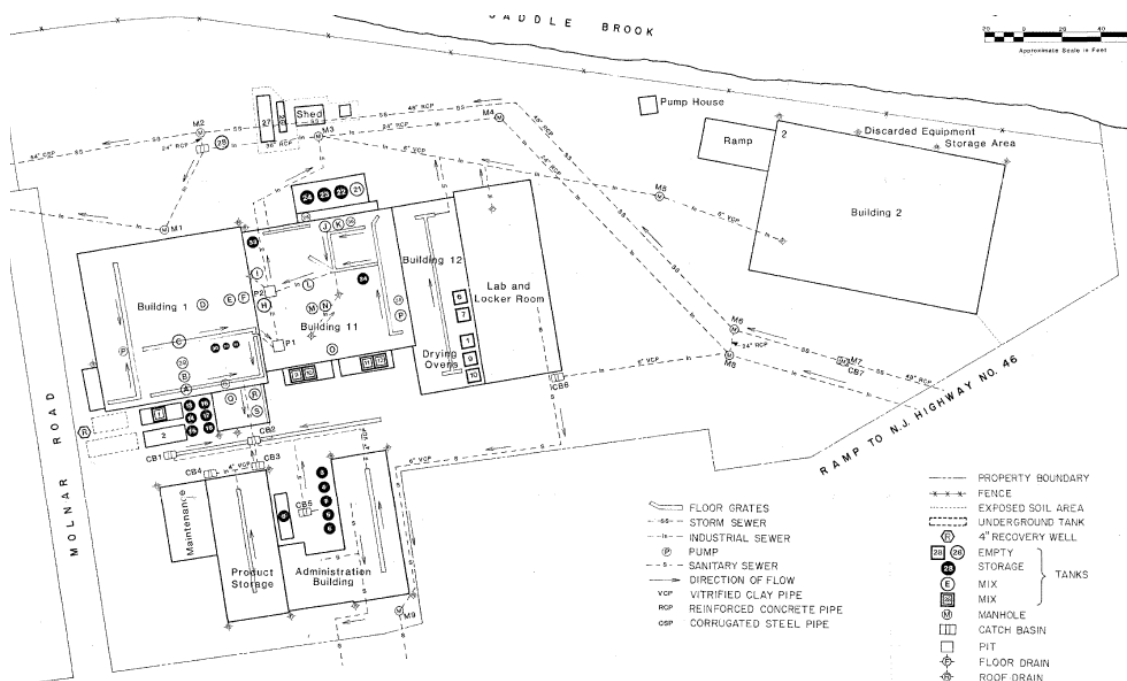
In 1987, Environ Corporation inspected the storm drain and industrial sewer systems at the Hexcel facility and traced their outfall points. As documented in the letter report from Environ Corporation to NJDEP, dated March 25, 1987, two major drain systems crossed the facility property, shown on the drainage system figure below. The storm drain ran

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parallel and directly west of the industrial sewer line, which was part of the PVSC system. The storm drain entered the property near manhole M7, then flowed south to manholes M6 and M2. After exiting the property, the storm drain pipe was traced to an outfall into Saddle Brook approximately 900 feet south of the facility and immediately south of the Hendrix wastewater pumping station. A second drain pipe entered the property near manhole M8, but then joined with the storm drain at this manhole because the path to the southwest (likely to manhole M4) was almost completely clogged with sediment. The industrial sewer line behind the property ran from manhole M4 to manhole M3, a catch basin, and then manhole M1. Several smaller sewer drains from the facility were observed at manhole M3. The industrial sewer discharged to the south across Molnar Road and to the Hendrix pump station, where water was discharged into a wet well and then combined with other sanitary sewer lines before it was pumped into the PVSC system. It was also noted that the connection between M2 of the storm sewer and the catch basin of the industrial sewer was blocked, so the systems were not interconnected at this point (PAP-00326356-58).



(PAS-00326352)

Additional investigation of the industrial sewer system on April 14, 1987, found that process wastewater was flowing upstream from manhole M4 to M8, possibly due to high inflow to the sewer system or blockage downstream. A dye test conducted on that day confirmed that water in the industrial sewer was flowing from manhole M4 to manhole M8 at which point it entered the storm drainage system. This reversal of flow had been observed on only one occasion throughout the period of sewer inspection and testing during 1987, and was stated to be a short-term condition that occurred during periods of high inflow into the sewer system (PAS-00091047).

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As discussed in the *Preliminary Feasibility Study Report for Alternate Discharge to the PVSC*, dated March 16, 1992, pretreatment of seepage water from the basement was initiated when PCBs were discovered at the site in 1985. The report presumed that prior to 1985, the water had been discharged directly to the PVSC industrial sewer without treatment. Pretreatment consisted of diatomaceous earth and granular activated carbon filtration with batch testing for PCBs. Water was discharged to the PVSC after sample results did not detect PCBs. In 1989, complete removal of PCBs became more difficult, so seepage water was sent off-site to the Chambers Works DuPont facility in Deepwater, New Jersey. However, DuPont discontinued acceptance of the seepage water in August 1989 due to the presence of PCBs at unacceptable levels. Treatment of the seepage water was added to the site remediation activities in September 1990. A batch chemical treatment with carbon filtration was used, and the water was discharged in accordance with the terms of the PVSC discharge permit. An average total of 200 gallons of basement seepage water were discharged per day in 1991 (PAS-00088621).

4. Identified COCs

- PCBs (released/used)
- PAHs (detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

PCBs

Site investigations have been performed since 1984, when leaking fuel oil USTs were noted at the site (PAS-00091706). The reports summarized below state PCB contamination was found in soil surrounding the former boiler room and along the industrial sewer line. The PCBs appear to be related to the oil used in the boiler room (PAS-00091037-40).

The following table summarizes the maximum PCB concentrations detected in site media and river sediment from the adjacent Saddle River:

Maximum PCB Concentrations in Site Media (mg/kg)				
PCBs	Aroclor-1242	Reference	Aroclor-1248	Reference
Soil	4,500	PAP-00325568	26,000	PAS-00002559
Oil	9,970	PAS-00091032	10,940	PAS-00091041
Sewer Sediment			240	PAS-00091037
Saddle River Sediment	Not detected	PAS-00086066	0.42	PAS-00086066

A Review of Prior Sampling Programs at HEXCEL'S Lodi Facility, dated January 10, 1986, identified ten Areas of Concern (AOCs), two of which were contaminated with PCBs (i.e., AOCs A and B) (PAS-00091335-36). According to the *Summary Report of Preliminary Environmental Sampling at the Fine Organics Corporation Facility, Lodi, NJ*, dated October 14, 1987, the level of PCB contamination ranged from 4 to 11.6 ppm in soil samples collected from the vicinity of the USTs (AOC A), while the pit in Building No.

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1 (AOC B) had PCB concentrations up to 9,970 mg/kg (Aroclor-1242) in the oil floating on water. PCB analyses of the water inside the pit were non-detect (<10 ug/L) and 0.8 mg/kg, while the PCB concentration for the "wall scraping" from the pit was 62 mg/kg (PAS-00091030).

Further investigation of the facility in 1987 determined that oil was in sandy soil (with soil PCB concentrations up to 150 ppm) beneath the boiler room in Building 1. PCB concentrations in soil generally decreased with depth to the clay layer below. A sample of the oil floating on groundwater in a boring installed in the boiler room detected PCBs at 10,940 mg/kg (PAS-00091039-40). Oil was also found to be accumulating in Manhole M1 and stormwater catch basin CB8 of the industrial sewer at the rear of the property. PCBs were detected in sediment samples along the main line of the industrial sewer system on the facility property, ranging from 10 mg/kg to 240 mg/kg, with generally increasing concentrations toward the Hendrix pump station sewer system (PAS-00091036-38).

According to a report titled *Characterization of Oil Samples – Hexcel Project 536A*, dated February 12, 1987, three oil samples were collected from the site and analyzed for PCBs, metals, volatile organic compounds (VOCs), and infrared spectra to determine if they were derived from the same source. The analyte list was determined based on preliminary information that suggested the oil could be Mobiltherm oil, which was produced for heat transfer operations and could also include reclaimed mixtures of oil products from various manufacturers. Mobiltherm oil is reported to handle high temperatures (550°F) where normal, petroleum oils decompose (PAS-00091111). The oil sample collected from the floor drain in the concrete pit from Building No. 1 had the highest PCB content (maximum of 1,350 ppm), and the sample from the manhole M1, which is part of the PVSC industrial sewer located outside Building No. 1, had slightly lower PCB content (900 ppm). The sample collected from the recovery well had the lowest PCB content (60 ppm) (PAS-00091116). The letter from Environ Corporation to NJDEP documenting these analyses stated that the oil in manhole M1 appears to be chemically different than the oil from the other two locations. Oil in the manhole was being removed weekly by bailing and was estimated to accumulate 10 to 15 gallons per month (PAS-00091104).

According to the *Summary Report of Preliminary Environmental Sampling at the Fine Organics Corporation*, dated October 14, 1987, characterization of sediment in the industrial sewer line closer to and including the Hendrix pump station detected PCBs, but a potential additional offsite source was also identified. The PCB detected in the sediment sample from the manhole on the Napp Chemical Co. property was Aroclor-1260, while Aroclors-1242 and -1248 were detected in the samples at the Hexcel facility. Sediment sampling at the Hendrix Pump Station outfalls reported 7,660 mg/kg PCBs (Aroclor-1242) from the industrial sewer system and 1420 mg/kg PCBs (Aroclor-1242) from the sanitary sewer. The sediment samples collected from Saddle Brook at the outfall from the storm drain system detected PCBs at 0.3 and 2.4 mg/kg (Aroclor-1242) (PAS-00091041-42).

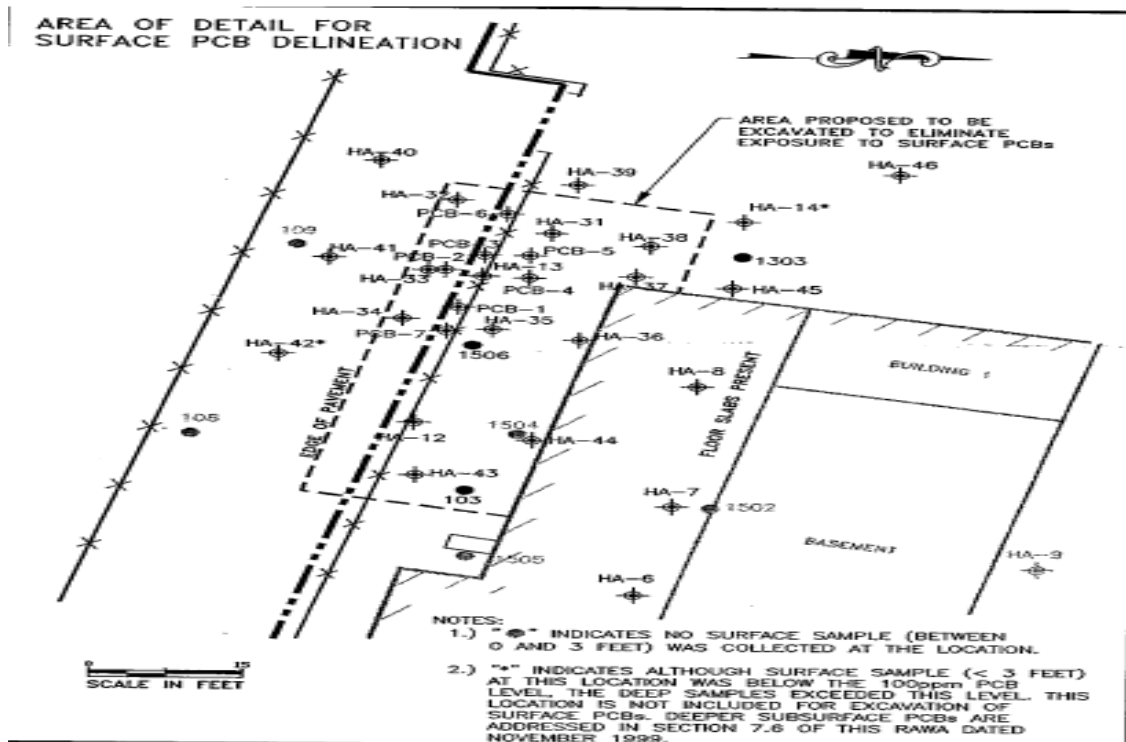
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Three abandoned USTs were removed on June 19 and 20, 1991, according to the *Underground Storage Tank Closure Assessment Report*, dated August 27, 1991 (PAS-00089015). A 500-gallon gasoline tank was located north of Building 6 and two fuel oil tanks (4,000-gallon and 2,000-gallon) were located east of Building 1 and adjacent to the boiler room (PAS-00089015). Upon removal, the tanks were noted to be corroded with holes. Soil samples collected from the walls of both excavations detected PCBs (Aroclor-1242 at 0.024, 0.048, and 0.187 mg/kg). The soil sample collected from the bottom of the gasoline UST excavation detected Aroclor-1242 at 2.357 mg/kg. In addition, a water sample collected from the pit of the fuel oil UST excavation detected Aroclor-1242 at 48 micrograms/liter ($\mu\text{g/L}$) (PAS-00089019-23).

The 1999 RAWP Addendum categorized the PCB contamination in site soil into two areas: the elevated levels of PCBs on the ground surface in the vicinity of the former boiler room and PCBs primarily associated with dense non-aqueous phase liquid (DNAPL) at depth and detected in the upper overburden soil samples. The 1999 RAWP Addendum proposed to excavate the surface soil to a depth of 2 ft bgs and from Molnar Road to the edge of the former boiler room, as shown in the figure below. A 2-Phase Extraction remediation process was proposed for the DNAPL, so the 1999 RAWP Addendum stated the PCBs detections at depth would be reassessed after this process was implemented (PAS-00002506-07).



(PAS-00002606)

The 1999 RAWP Addendum also stated that the industrial sewer line was reported to be filled with sediments with elevated levels of PCBs. The sewer line was a 24-inch reinforced concrete pipe that ran from the vicinity of the existing warehouse to the

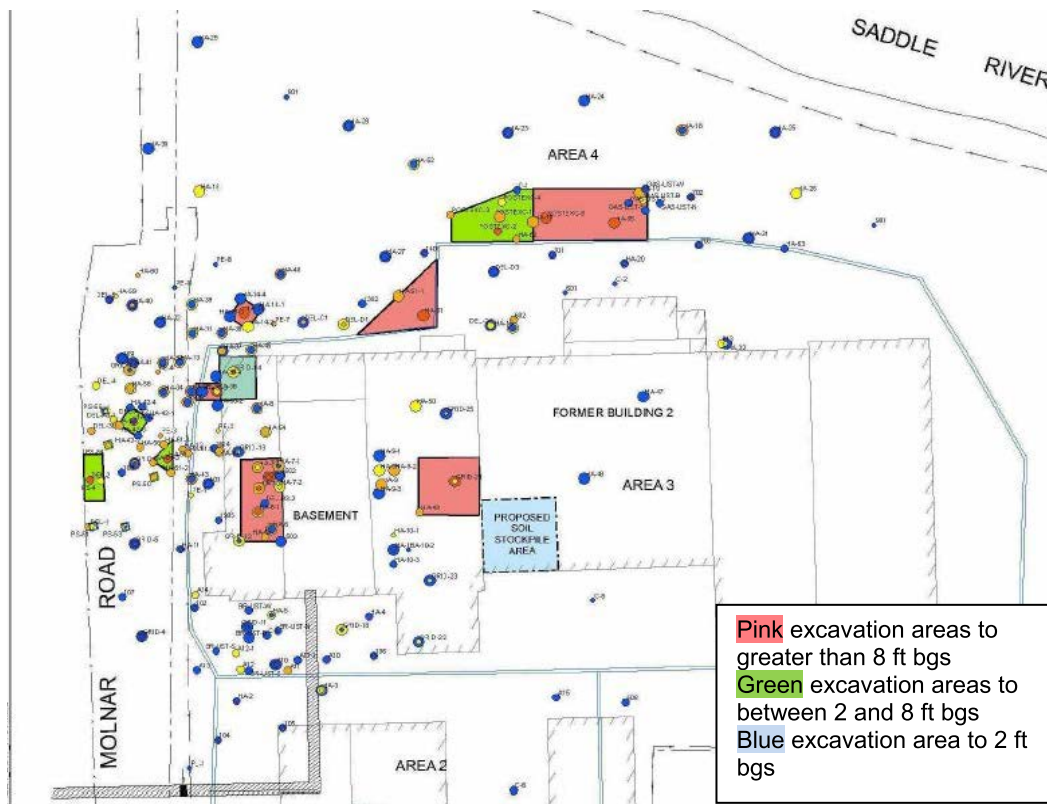
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Hendrix pump station (PAS-00002508). According to a *Status Report*, dated May 10, 2005, the entire length of the industrial sewer on the Hexcel property from manhole M-8 to manhole M-1 was removed in 2003. At the same time, a hot-spot excavation at HA-17 was performed to remove the 1,800 ppm detection of PCBs. Approximately 400 tons of contaminated soil were removed during these excavations; however, soil with concentrations up to 300 mg/kg Aroclor-1242 were left in place near HA-17 (PAP-00325152, 61).

The *Self-Implementing PCB Cleanup and Disposal Plan*, dated June 20, 2008 (the Cleanup Plan), discussed the two areas of suspected PCB impacts, including the area associated with the former boiler room and the area associated with the former industrial sewer. The Cleanup Plan proposed to excavate several additional areas due to PCB contamination. These excavations would address detections of PCBs over 100 ppm. The deeper excavations were stated to extend only to the top of the confining clay layer because it would protect the lower formation from residual contamination in the confining layer. According to Table 1 of the Cleanup Plan, the maximum detection of PCBs was 13,000 ppm (Aroclor-1248) at HA-7, located under the former boiler room (see area adjacent to the basement in the figure below) (PAP-00325538, 40, 72, 86).



(PAP-00325586)

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According to the *Remedial Investigation Report and RAWP Addendum*, dated January 28, 2011 (the 2011 RIR), excavation of soil approximately 10 feet by 5 feet by 1-foot deep around sample Surf-7 was performed to remove surficial PCB contamination in order to facilitate the installation of a utility pole (PAP-00324823). Investigation of the storm sewer detected only Aroclor-1260 in one sample of eight samples collected at a concentration of 0.77 mg/kg (PAP-00324827, 977).

The *Soil Remedial Investigation Report/Remedial Action Report*, dated August 25, 2015 (the 2015 RIR/RAR) documented the excavations performed at the site. The following soils were removed from 2010 to 2015:

Excavations Performed in 2010-2011			
Excavation	Area (square feet)	Depth (ft bgs)	Volume (cubic yards)
L2	225	2	17
L3	140	17	40
L4	320	16	200
L5	420	13.5	160
L6	800	14-15	487
L7	400	11	163
L8	480	8.5-10	250
SURF-7	40	1	
SURF-13	25	1	
SURF-20	100	1	
REM-1	150	4	
REM-5	730	13	

(PAP-00047433-37)

PAHs

A report of soil data for the site was undated and did not include the title of the report but provided soil sampling results from the 1980s through 1992. This report stated PAHs were detected at low levels in several soil samples (see discussion for Historic Fill below) (PAS-00088282, 319).

The *Summary of Historical Soil Data*, dated July 1997, concluded that base neutral organics are not of concern for the site. The *Summary of Historical Soil Data*, dated July 1997 did not provide all of the data, but specified the concentrations that exceeded the soil cleanup criteria in the 46 soil samples collected at the site. Benzo(a)anthracene was the only PAH that exceeded the criteria and was detected at 1.4 mg/kg (PAS-00087498, 516).

The 2015 RIR/RAR stated that naphthalene was detected in two post-excavation samples for the industrial sewer at 13 mg/kg and 37 mg/kg. These sample locations were excavated in 2011 (PAP-00047449-50).

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Facility Data Report***Metals - Copper, Lead and Mercury***

As documented in the *Summary of Historical Soil Data*, dated July 1997, mercury was detected at 236 mg/kg in site soil (PAS-00087516).

According to the *Presentation of the ECRA Sampling Results for Hexcel Corporation*, dated December 1988, copper was detected in three soil samples at concentrations of 8 to 96 mg/kg (PAS-00090408-411).

A Narrative Report of Interpretation on Results for Hexcel Facility, dated July 18, 1985, identified lead detected at the site. Lead was detected in sample C-1 (96 ppm) at a depth of 24 to 30 inches and at C-5 (130 ppm) at 18 to 24 inches. This report states that lead was never used or stored onsite (PAS-00091426, 36-37).

According to the *Presentation of the ECRA Sampling Results for Hexcel Corporation*, dated December 1988, lead was detected in soil samples from across the site at concentrations of 3 to 72 mg/kg (PAS-00090393-411).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.¹ However, the 2011 RIR states that the metals contamination in site groundwater may be due to the presence of Historic Fill (PAP-00324817).

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.² Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.³ PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.⁴

¹Digital Geodata Series, DGS04-7, *Historic Fill for New Jersey*, <https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm>, Quadrangle #31 (NJDEP map identifying locations of recognized historic fill).

² *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes in New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

³ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

⁴ NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00087498, 516; PAS-00088282, 319-20; PAS-00090408-411; PAS-00091426).

COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	290 mg/kg
Copper	123 mg/kg
Mercury	236 mg/kg
Benzo(a)anthracene	1.4 mg/kg
Benzo(a)pyrene	0.25930 J mg/kg
Benzo(b)fluoranthene	0.13949 J mg/kg
Benzo(k)fluoranthene	0.25307 J mg/kg
Dibenzo(a,h)anthracene	0.13161 mg/kg
Indeno(1,2,3-cd)pyrene	0.08747 mg/kg

The PAHs and metals results were provided in a document without a title page prepared by Killam. The document summarized the data collected at the site in the 1980s and early 1990s (PAS-00088172).

5. COC Pathways***Sanitary Sewer***

According to the 1986 SES, cooling water and wastewater from washing out the blending tanks were discharged to the PVSC under permit and monitored by a 24-hour sampling device (PAP-00326370). The amount of wastewater discharged to the PVSC in 1978 was an estimated 135,600 gallons per day for continuous operations six days a week, according to an Industrial Sewer Connection Application, dated May 30, 1978 (PAP-00326713-14). An application for a Sewer Connection Permit, dated July 9, 1985, stated that Hexcel discharged 130,000 gallons of process water and 4,552,982 gallons of cooling water to the sanitary/combined sewer system from third quarter 1984 to second quarter 1985. The daily flow through outlet 17402370 was an estimated 19,550 gallons (PAP-00326659, 62, 68).

As discussed in the *Preliminary Feasibility Study Report for Alternate Discharge to the PVSC*, dated March 16, 1992, pretreatment (diatomaceous earth and granular activated carbon filtration) of seepage water from the basement was initiated when PCBs were discovered at the site in 1985. The report presumed that prior to 1985, the water had been discharged directly to the PVSC industrial sewer without treatment (PAS-00088621).

A letter report from Environ Corporation to the PVSC, dated March 14, 1988 describes the remedial actions taken at the site to address the PCBs and oil in the industrial sewer. Oil was observed floating on the water in the last manhole on the property, and oil absorbent pillows were installed in the manhole and a catch basin on the industrial sewer system to remove any floating oil. The letter stated the manhole and catch basin were acting as an oil trap to prevent the release of oil downstream through the sewer

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system to the pump station. Monthly monitoring of the sewer system began in October 1987, and samples from the farthest downstream manhole detected PCBs one time at 0.072 ppm in the first six months of monitoring. PCBs were also detected at the Hendrix pump station at 0.006 ppm during the same month that PCBs were detected in the sewer (PAS-00090938-39).

Additional monthly monitoring detected PCBs at concentrations up to 1.2 milligrams/liter (mg/L) in the manhole; PCBs were only detected one time (650 µg/L) at the Hendrix pump station from June to October, 1988 and August to October, 1990 (PAS-00090901; PAS-00089431). The sample from the manhole with the highest PCB concentration was collected in October 1990 and was stated to be slightly higher than levels detected in previous samples due to active construction activities that were part of the overall site remediation. The samples collected at the wet well of the Hendricks pump station stated no detectable levels of PCBs in the industrial sewer inlet pipe to the pump station during this time (PAS-00089431). Monthly monitoring continued through 1991 (PAS-00088902).

The letter from Environ Corporation to NJDEP regarding the Characterization of Oil Samples – Hexcel Project 536A, dated February 12, 1987 stated that the oil in manhole M1 was being removed weekly by bailing and was estimated to accumulate 10 to 15 gallons per month (PAS-00091104).

The letter from Environ Corporation to the PVSC, dated March 14, 1988 also stated a small amount of oil was accumulating with water in a below-ground pit in Building No. 1. These accumulating liquids were previously pumped into a dual-stage diatomaceous earth/granulated activated carbon treatment system for removal of oils and any aqueous phase PCBs, with the effluent discharged through the PVSC permitted sewer outfall into the industrial sewer system (PAS-00090938-39). As discussed in the *Preliminary Feasibility Study Report for Alternate Discharge to the PVSC*, dated March 16, 1992, the basement seepage water was treated this way until 1989, when complete removal of PCBs became more difficult. It was shipped offsite briefly before being treated onsite again using batch chemical treatment with carbon filtration in 1990 and discharged at an average rate of 200 gallons per day in 1991 (PAS-00088621).

According to the letter from Hexcel to the PVSC, dated May 20, 1994, all discharges to the PVSC ceased as of November 30, 1992. The basement seepage water was then treated and shipped offsite for disposal. Due to Hexcel's filing for bankruptcy, the basement seepage water was not treated (PAS-00087885-86).

A letter report to the NJDEP regarding the Hexcel site, dated July 17, 1995, stated that a new sewer line for a groundwater treatment system was installed in 1995 (PAS-00087777). According to a *Status Report*, dated May 10, 2005, the entire length of the industrial sewer on the Hexcel property from manhole M-8 to manhole M-1 was removed in 2003 (PAP-00325152).

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Facility Data Report***Storm Sewer***

As discussed in the March 25, 1987, letter report by Environ Corporation to the NJDEP, the storm drain entered the property at the northeast corner of the property near manhole M7, then flowed south to manholes M6 and M2. After exiting the property, the storm drain pipe was traced to an outfall into Saddle Brook approximately 900 feet south of the facility and immediately south of the Hendrix wastewater pumping station (PAP-00326356-57).

The 2003 Report on Sediment and Surface Water Sampling Program stated that samples from the storm sewer outfall area delineated previous PCB contamination characterized in October 1997 (PAS-00086066). The maximum detected PCB concentration was 1.3 mg/kg (Aroclor-1242) collected from sediment location directly downstream from the outfall (PAS-00086092). Historical sediment sample results from 1997 are provided in Table D-4 (Historical Sediment Quality Data) of the report and state PCBs were detected in Saddle River sediment up to 300 mg/kg; note the range of the other sediment samples was non-detect to 2.7 mg/L (PAS-00086124).

The Status Report, dated May 10, 2005, stated that surface water and sediments in the Saddle River adjacent to the site were minimally impacted by the potential migration of compounds of concern from the site (PAP-00325153). According to the 2011 RIR, NJDEP approved that no further investigation was required for the storm sewer outfall in a letter from July 2010 (PAP-00324827). Soil samples collected along the storm sewer on the property detected only Aroclor-1260 in one sample of eight samples collected at a concentration of 0.77 mg/kg (PAP-00324827, 977).

Direct Release

The Review of June and August 1985 Sampling Programs discusses the surface water flow across the site to the Saddle River. At the north of the site, stormwater from the parking lot flows into storm sewers and not the Saddle River. Stormwater can discharge to the river behind Building No. 2 (PAS-00091276).

The 2003 Report on Sediment and Surface Water Sampling Program concluded that surface water quality in the Saddle River adjacent to the site has not been adversely impacted by the potential migration of compounds of concern from the site. PCBs were not detected in any of the surface water samples collected. In addition, the report concluded that there was no significant migration of PCBs offsite based on the non-detection of Aroclor-1242, the primary PCB Aroclor of concern, and the one detection of Aroclor-1248 at a relatively low concentration (0.42 mg/kg) in the 14 sediment samples collected (PAS-00086066, 69, 91).

Spills

As discussed above in Section 3, investigation at the site began in 1984 in response to leaking fuel oil USTs. Fuel oil was found to be in the soil and gravel surrounding the USTs (PAS-00091716). It was suspected that two USTs had been leaking fuel oil for years (PAS-00091430).

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Facility Data Report**6. Regulatory History/Enforcement Actions**

When Hexcel sold its Lodi business and property to FOA Corporation in 1986, the facility was assigned ECRA case No. 86009. Due to this transaction, an Administrative Consent Order was signed in March 26, 1986 to move the facility through the NJDEP ECRA process (PAS-00091243). According to the *Remedial Investigation Report*, dated May 2016, investigation and remediation activities were conducted under NJDEP Site Remediation Program case manager oversight until the spring of 2010, when the case oversight was transferred to the Office of Brownfields. In February 2012, Hexcel opted into the Licensed Site Remediation Professional (LSRP) program to oversee and review documents related to remediation at the site. Christopher Schmitt (LSRP IDNo. 586933) is the LSRP for the site (PAP-00047694).

Inspections

Inspections performed by NJDEP on August 15 and September 2, 1986 as part of the ECRA process identified deficiencies, including an uncertain drainage network (interior floor drains, roof drains, storm, domestic and industrial sewer) and unknown composition of the lubricating oil and the age of the transformer (PAS-00091237-38).

Violations

Two violations were noted in the ECRA application. One is stated to be related to failure to submit information to local agencies, while the other is a notice that spills and leaking drums were observed close to the east bank of the Saddle River during a state inspection in the September of 1984. Both violations were stated to be resolved (PAS-00091296-97). The document does not state these violations involved OU2 COCs.

Permits

PVSC permit No. 17402370 was effective January 26, 1981 and expired January 26, 1986. The permit allowed discharge to the PVSC through outfall 17402370-37430-01171 (PAP-00326695, 99; PAS-00091296).

PVSC permit No. 17402372 was effective January 21, 1986 and expired January 21, 1991. The permit allowed discharge to the PVSC through outfall 17402371-37430-0171 (industrial waste outlets 1 through 4) and 17402372-37430-0171 (sanitary waste outlets 5 and 6) (PAP-00326679, 83-84).

Fine Organics Corporation Sewer Connection Permit No. 17405042 was effective on May 27, 1991. It included discharge and monitoring requirements for pretreated groundwater and basement seepage resulting from Hexcel Corporation's operation of a groundwater pretreatment system. The Hexcel portion of the sewer connection permit expired on November 30, 1991 (PAS-00088620).

New Jersey Pollutant Discharge Elimination System (NJPDES) Permit No. NJ0081507 was effective November 11, 1992 and expired August 31, 1997. The permit was for discharges to the PVSC and to surface water (PAP-00047893).

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PVSC permit No. 17407540 was effective May 16, 1996 and expired May 16, 2001. The permit allowed discharge from outlet number 17407540-37430-0171 with monthly monitoring for PCBs and metals, including lead, copper, and mercury (PAP-00047871-77).

The NJPDES Permit No. NJ0145378 from was effective January 1, 2004 and expired December 31, 2008 (PAP-00047855, 58).

7. Response Actions***Characterization Activities***

The following characterization activities have taken place at the facility:

- Investigation of Fuel Oil Leak for Hexcel (June 27, 1984) (PAS-00091704)
- Narrative Report of Interpretation on Results for Hexcel Facility (July 18, 1985) (PAS-00091417)
- Review of Prior Sampling Programs at Hexcel's Lodi Facility (January 10, 1986) (PAS-00091332)
- June and August 1985 Sampling Programs (January 13, 1986) (PAS-00091270)
- Administrative Consent Order (March 26, 1986) (PAS-00091241-48)
- Characterization of Oil Samples (February 12, 1987) (PAS-00091110)
- Summary Report of Preliminary Environmental Sampling at the Fine Organics Corporation (October 14, 1987) (PAS-00091023)
- Presentation of the ECRA Sampling Results for Hexcel Corporation (December 1988) (PAS-00090232; PAS-00090378)
- Underground Storage Tank Closure Assessment Report (August 27, 1991) (PAS-00089012)
- Summary of Historical Soil Data (July 1997) (PAS-00087494)
- Summary of Historical Groundwater Data (July 1997) (PAS-00087475)
- Remedial Action Work Plan Addendum (November 1999) (PAS-00002490)
- Report on Sediment and Surface Water Sampling Program (October 8, 2003) (PAS-00086055)
- Self-Implementing PCB Cleanup and Disposal Plan (June 20, 2008) (PAP-00325528)
- Remedial Investigation Report and Remedial Action Work Plan Addendum (January 28, 2011) (PAP-00324786)
- Soil Remedial Investigation Report and Remedial Action Report (August 25, 2015) (PAP-00047406-407)

Soil

As discussed in the 2008 Cleanup Plan, the two areas of suspected PCB impacts are the area associated with the former boiler room and the area associated with the former industrial sewer. The 2008 Cleanup Plan proposed to excavate several areas due to PCB contamination in soil over 100 ppm. According to Table 1 (Soil PCB Data) of the

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2008 Cleanup Plan, the maximum detection of PCBs was 13,000 ppm (Aroclor-1248) at HA-7, located under the former boiler room (PAP-00325538, 72, 86).

Sewer

During an investigation of the facility's industrial sewer system in December 1986, oil was observed to be floating on the water surface in manhole M1, which is located to the rear of Building No. 1. Oil was not observed in the other manholes and structures on the industrial sewer. Manual bailing removed approximately 75 gallons of oil during the investigation and 30 gallons several weeks after (PAS-00091033-34). The concentration of PCBs (Aroclor-1248) in sediments from the industrial sewer ranged from 10 mg/kg to 240 mg/kg, with generally increasing concentrations toward the Hendrix pump station sewer system (PAS-00091037-38).

According to a *Status Report*, dated May 10, 2005, the entire length of the industrial sewer on the Hexcel property from manhole M-8 to manhole M-1 was removed in 2003. At the same time, a hot-spot excavation at HA-17 was performed to remove the 1,800 ppm detection of PCBs. Approximately 400 tons of contaminated soil were removed during these excavations; however, soil with concentrations up to 300 mg/kg Aroclor-1242 were left in place near HA-17 (PAP-00325152, 61).

Sediment

Surface water and sediment of the Saddle River were characterized in the *Report on Sediment and Surface Water Sampling Program*, dated October 8, 2003. This report documented surface water and soil samples collected from the Saddle River adjacent to the site, as well as samples from a storm sewer outfall located approximately 750 feet south and downstream of the site (PAS-00086056). According to this report, PCBs were not detected in any of the surface water samples collected adjacent to the site. Aroclor-1242, the primary PCB Aroclor of concern, was not detected in any of the 14 sediment samples collected along the site. However, Aroclor-1248 was detected in one sediment sample at 0.42 mg/kg. Aroclor-1254 was detected at 0.49 mg/kg adjacent to the facility (PAS-00086063, 65, 91). Samples from the storm sewer outfall area delineated previous PCB contamination characterized in October 1997 (PAS-00086066). The maximum detected PCB concentration was 1.3 mg/kg (Aroclor-1242) collected from sediment located directly downstream from the outfall (PAS-00086092). Historical sediment sample results from 1997 are provided in Table D-4 (Historical Sediment Quality Data) and report PCB concentrations detected in Saddle River sediment ranged from non-detect to 2.7 mg/kg with the exception of a maximum detection of 300 mg/kg (PAS-00086124).

According to the 2011 RIR, NJDEP approved that no further investigation for the Saddle River and stormwater outfall was required at that time in a letter from July 2010. Although the NJDEP did not require any further investigation of the Saddle River, the July 2010 letter required that Hexcel propose a remediation for contaminated groundwater to ensure that no groundwater discharges enter the Saddle River at concentrations that exceed the Surface Water Quality Standards (SWQS) (PAP-00324826).

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Remedial Actions

The *Investigation of Fuel Oil Leak for Hexcel, Lodi, New Jersey*, dated June 27, 1984, describes soil sampling for an oil leak from a UST. The investigation found visible oil in nine of 12 soil borings (PAS-00091712). Saddle Brook River is located 150 to 200 feet to the west of the UST (PAS-00091715). The report concluded that the oil is present in sand and gravel layers from 0.5 to 8 ft bgs, and that vertical movement of the oil is limited by a sandy silt layer, which has not been contaminated by the fuel oil (PAS-00091716).

According to a *Narrative Report of Interpretation on Results for Hexcel Facility*, dated July 18, 1985, lead and PCBs were detected at the site. Lead was detected in sample C-1 (96 ppm) at a depth of 24 to 30 inches and at C-5 (130 ppm) at 18 to 24 inches. This report states that lead was never used or stored onsite (PAS-00091423, 26, 36-37).

The *Review of June and August 1985 Sampling Programs*, dated January 13, 1986, discussed differences between the summer sampling results and reported additional sampling performed in December 1985. Discussion of the PCBs detected in the recovery well stated heat transfer oils that may have contained PCBs were used prior to 1981 in the boiler room adjacent to the oil recovery well (PAS-00091273). Additional sampling of a concrete-lined pit located within Building No. 1 was performed to confirm that the contamination was present. This area was actively used at that time for organic chemical formulation. Previous sampling had detected PCBs in wall wipe samples (62 ppm) and in the water at the base (173 ppm). A sample was collected from the oil floating on water in the drain, and PCBs were detected at 8,070 to 9,970 ppm. A sample of the water did not detect PCBs (PAS-00091282-83). It was noted that the pit was periodically pumped to the industrial sewer to remove accumulated seepage or spillage within the building (PAS-00091286).

Hexcel and NJDEP signed an Administrative Consent Order on March 26, 1986 for the cleanup of the site (PAS-00091241-8).

A letter report from Environ Corporation to the PVSC, dated March 14, 1988, describes the remedial actions taken at the site for remediation of the PCBs and oil in the industrial sewer. Beginning in early 1987, the sewer system was regularly monitored for any accumulation of oil and to remove any floating product. Oil absorbent pillows were installed in a manhole and catch basin on the industrial sewer system to remove any floating oil. These pillows were inspected weekly and changed as frequently as necessary. The removed oil was retained onsite in sealed drums until it was shipped offsite for final destruction and disposal in accordance with State and Federal regulations (PAP-00325294).

The *Presentation of the ECRA Sampling Results for Hexcel Corporation*, dated December 1988, defined 15 areas of environmental concern (AECs) at the facility (PAS-00090240). PCBs were detected at three AECs, including a soil sample collected from AEC 15, the boiler room, at a depth of 8 to 8.5 ft bgs with PCBs at 31 mg/kg (PAS-00090266-67). PCBs were also detected near USTs and aboveground storage tanks

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(ASTs) at AEC 1 (0.26 mg/kg) (PAS-00090390) and AEC 7 (0.68 mg/kg) (PAS-00090407).

Three abandoned USTs were removed on June 19 and 20, 1991. The 500-gallon gasoline tank was located north of Building 6, and the two fuel oil tanks (4,000-gallon and 2,000-gallon) were located east of Building 1 and adjacent to the Boiler room (PAS-00089015). Upon removal, holes in the tanks were noted due to corrosion. Soil samples collected from the walls of both excavations detected PCBs (Aroclor-1242 at 24, 32, and 187 µg/kg). Aroclor-1242 was detected in the soil sample collected from the bottom of the gasoline UST excavation at 2,357 µg/kg. In addition, Aroclor-1242 was detected in a water sample collected from the pit of the fuel oil UST excavation at 48 µg/L (PAS-00089019-23).

A 1997 Summary of Historical Soil Data provides an overview of the soil samples collected from 1984 to 1992. As stated in this report, PCBs were detected in soil samples from borings around the boiler room and from borings around the ASTs located west of Building 2. The detection of metals was sporadic, and it was concluded that metals were not of significant concern for this site (PAS-00087498-99).

The November 1999 RAWP Addendum identified several areas of environmental concern, including Base/Neutral and Acid Extractable Organics (BNAs) and Priority Pollutant Metals (PPMs) (AOC 3), PCB contamination at the site (AOC 6), the Saddle River (AOC 8), the storm sewer outfall (AOC 9), and the industrial sewer line (AOC 10) (PAS-00002503).

Surface water and sediment of the Saddle River were characterized in the *Report on Sediment and Surface Water Sampling Program*, dated October 8, 2003. This report documented surface water and soil samples collected from the Saddle River adjacent to the site, as well as samples from a storm sewer outfall located approximately 750 feet south and downstream of the site (PAS-00086056).

The 2011 RIR stated excavation of PCB contaminated soil was expected to be completed in spring of 2011. Additionally, excavation of soil approximately 10 feet by 5 feet by 1-foot deep around sample Surf-7 was performed to remove surficial PCB contamination in order to facilitate the installation of a utility pole (PAP-00324823).

8. Summary of Asserted Defenses

Hexcel asserts, Permitted releases are exempt from the definition of “release” under CERCLA [Comprehensive Environmental Response, Compensation, and Liability Act]. 42 U.S.C. § 9601(10)(H). Applicable permits are described in response to Question 4.3. With respect to PAHs, Hexcel asserts the petroleum exclusion. 42 U.S.C. § 9601(14). Some or all of Hexcel’s liability for the Diamond Alkali Superfund Site was discharged in a Chapter 11 bankruptcy reorganization plan that was approved January 12, 1995.

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HOFFMANN-LA ROCHE, INC.

Facility Name, Address and Size: Hoffmann-La Roche (Roche), 340 Kingsland Road, Nutley, NJ 07710 (PAS-00123422). As of 1960-61, the site on Kingsland Road consisted of approximately 100 acres in size. Reports dated 1998 and 2004 stated the site as 123 and 125 acres, respectively (PAS-00123422). The Roche site employed 3,000 employees in 2005 (PAS-00123423). Available references did not include the number of work shifts at the site.

1. **Business Type:** From 1940 to 1946, Roche manufactured “ethical prescription medicines.” In 1960-61, Roche manufactured bulk “ethical pharmaceuticals” and vitamins and aromatic chemicals. As of 1998, the operations at the site were described as “manufacturing of pharmaceutical preparations.” The facilities on the site consist of administration, research and development, and pharmaceutical/medicinal chemical production (PAS-00123424).

2. **Time Period of Ownership/Operations**

Operator: 1930 to 2015

Owner: 1928 to 2016

3. **Operational History/COC Use and Presence at the Facility**

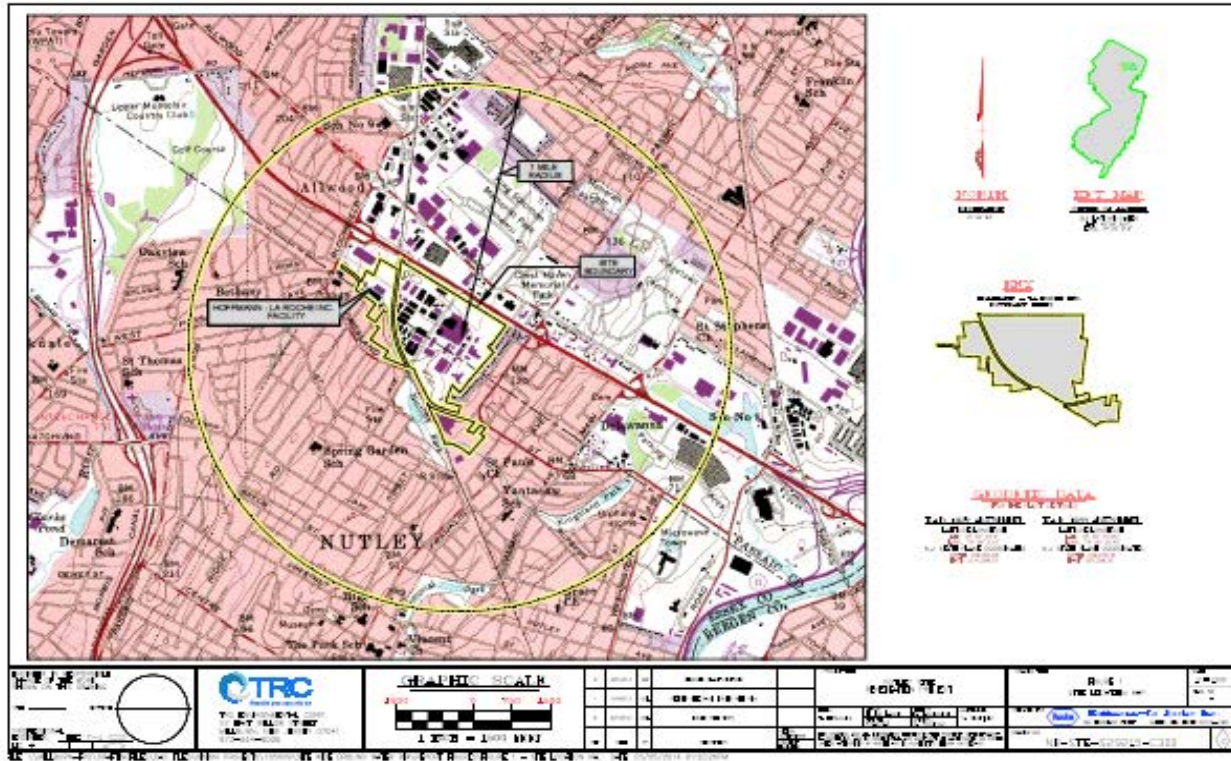
Historical operations on the site in the 1930s included Roche’s Strychnine Building (former Building 6), Carpenter/Maintenance Shop (former Building 12), Laradon Building (former Building 10), Sodium Building (former Building 5), Barbituric Building (former Building 4), Raw Product Storage (former Building 9), Boiler Building (former Building 3), garages, storage buildings, and sheds (former Building 2) (PAS-00123423).

By the 1940s, Roche occupied 90 acres of the site with approximately 28 buildings and a 640,000-gallon aboveground No. 6 fuel oil tank. From 1940 to 1946, Roche manufactured “ethical prescription medicines” (PAS-00123424). As of 1951, Roche still did not own the western portion of the site (west of the rail line); however, Haberland Manufacturing (converted to a chemical company) owned and operated a portion, including a 250,000-gallon reservoir. By the 1960s, many adjoining industrial parcels were acquired by Roche which formed the main complex (PAS-00123423).

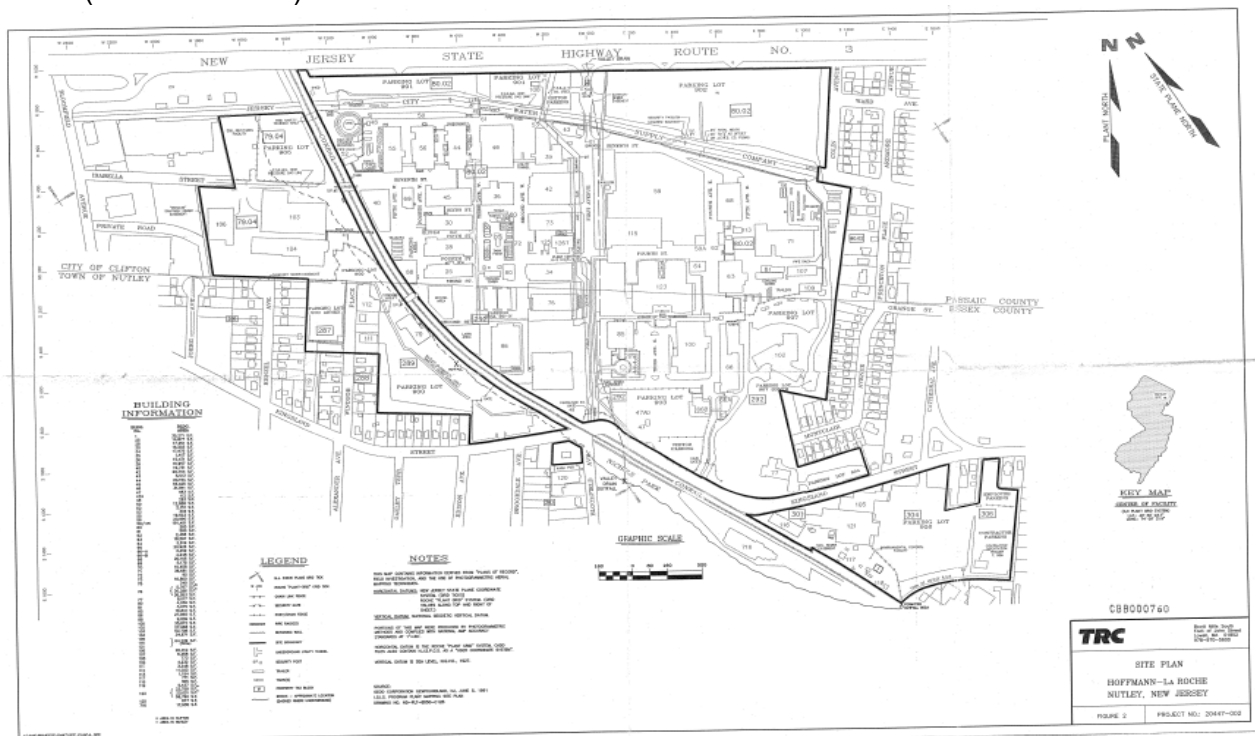
In 1960-61, Roche manufactured bulk “ethical pharmaceuticals” and vitamins and aromatic chemicals. As of 1998, there were fourteen main products manufactured at the site and were described as “manufacturing of pharmaceutical preparations” (PAS-00123424).

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(PAP-00189673)



(PAP-00003021)

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The facilities on the site consisted of administration, research and development, and pharmaceutical/medicinal chemical production. Drum storage of virgin materials and hazardous waste occurred in Building 106. Warehousing of virgin materials, products, intermediates, and equipment occurred in Buildings 103 and 104. Offices and parking were located in Building 112. Vehicle maintenance and storage occurred in Building 70. Trash compaction and vehicle storage occurred in Building 111. Numerous additional buildings (mostly production), storage tanks, and parking lots existed on the side of the site east of the Conrail line (PAS-00123424).

Raw materials were often conveyed to production buildings via underground pipes. In 1993, Roche initiated a program to replace pipes remaining directly in the ground with piping set into concrete trenches (PAS-00123245). Historical storage in tanks on site included the following materials (PAS-00123424-25):

Materials Stored in Tanks			
Hexane	Toluene	1-pentol	3-pentol
Fuel Oil No. 2	Fuel Oil No.6	Kerosene	Gasoline
Diesel Fuel	Solvents	Alcohols	Acids; bases
Product intermediates	Methanol	Dehydrolinalool	Wet Skelly
Dry Skelly	Ethyl Heptanone	Methylene Chloride	Ether
Formamide	Butendiol	Isobutylaldehyde	Waste Oil
Methyl Ethyl Ketone	Methyl Carbitol	Acetone	Methyl Formate
Isophytol	Ethyl Butynol	Beta Ionone	Chloroform
Pseudo Ionone	Propylene Glycol	Sulfuric Acid	Tetrahydrofuran (THF)
Trimethylphenol	Sodium Hydroxide	Acetic Anhydride	Ammonia
Toluene	Dowtherm	Pyridine	

A total of 171 Areas of Concern (AOCs) was identified at Roche, of which 109 AOCs were identified as warranting additional investigation (PAS-00002999-3014). Of these areas, AOC 67 was identified as the process sewer system. This AOC consists of Roche's process sewer system and all service connections to production buildings. The process sewer system was a subgrade piping system used to transport process waste water from manufacturing, laboratory, and support buildings, and also carried sanitary wastes from the facility to Roche's Environmental Control Facility. Many of the service connections were formerly constructed of glass piping. Formerly, many process sewer lines were in direct communication with subgrade soils. In the 1980s and 1990s, cracks in pipes may have released an undetermined volume of process water to the subsurface. Several releases involved oil that contains the COC PAHs (PAS-00003114-7).

Several AOCs (Nos. 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, and 78) were related to the presence of transformers located at the facility. These transformers were managed in accordance with Roche's Discharge Prevention Containment and Countermeasure (DPCC). The transformers were surrounded by an oil containment soil media which permits permeation of rainwater but disallows permeation of oils. This area was slightly bermed and covered with a layer of pea gravel. No releases were documented at these AOCs and therefore no further investigation was warranted (PAS-00003118-28).

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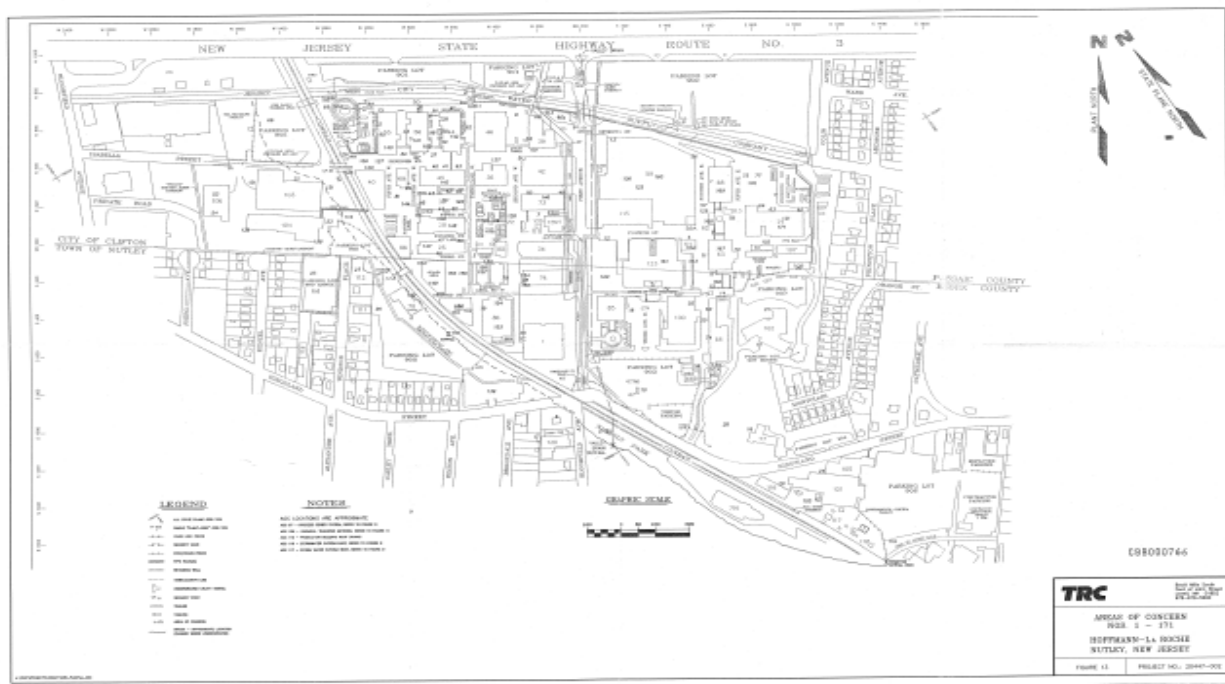
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AOC 116 was identified as the Storm Sewer System – East Side of Conrail Rail Easement. This storm sewer system was used to drain rainwater from the facility and to convey non-contact cooling water. Historically, the stormwater system may have been connected to the Valley Drain. A former stormwater outfall located across Kingsland Avenue in Nicholas Park was at one time used by Roche as the outlet for stormwater, in addition to the Valley Drain. Several releases were noted from 1988-1994, including 50 gallons of kerosene and 1,000 gallons of No. 6 fuel oil in 1989, but both were diverted to Roche's pretreatment facility (PAS-00003186-87).

AOC 117 was identified as the Storm Sewer System – West Side of Conrail Rail Easement. This storm sewer system was used to convey rainwater from the Roche property west of the Conrail Rail Easement. Stormwater from this area of the facility is discharged to St. Paul's Brook, south east of Building 70. There were no reported releases related to the OU2 COCs (PAS-00003188).

AOC 118 was identified as the Storm Water Outfall – St. Paul's Brook. This outfall received stormwater runoff from the Roche property west of the railroad easement. Storm sewer plans from the 1970s stated that drainage from Building 70 may have connected to the stormwater system in the vicinity of the stormwater outfall. However, during an environmental audit in 1995, a dye test was conducted. The results stated that the drains connected to the Clifton sewer system. Several releases to the storm sewer from chemical storage areas have been documented on the western side of the facility. Due to the documented releases to the storm sewer system from the chemical storage areas, investigation was planned for at this AOC (PAS-00003189).

The figure below identifies the 171 AOCs: (PAS-00003027)



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According to the *PRP Data Extraction Form*, dated August 22, 2005, “[s]urface water from the drainage basin in which (the site) resides are routed ultimately to the Passaic River, located slightly greater than one mile east’ of the site. St. Paul’s Brook, on the southwest side of the site is enclosed within a subgrade conduit on site except for a 100-foot stretch southeast of Building 70. St. Paul’s Brook discharges to the Passaic River (via the Third River). The Valley Drain, which discharges to St. Paul’s Brook, is also enclosed within a subgrade conduit. The Valley Drain runs north to south across the site. Both the Valley Drain and St. Paul’s Brook are ‘natural features that existed prior to the development of the region and contain flows on a year-round basis’” (PAS-00123430).

4. Identified COCs

- PCBs (released)
- PAHs (used, released)
- Dieldrin (detected)
- Copper (used)
- Lead (used, detected)
- Mercury (used, detected)

PCBs

Roche purchased the northwest corner of the site (referred to as northern IA-10) in 1967 (PAP-00215458). This parcel included a former industrial fill area; the filling preceded Roche’s purchase. The former industrial fill area contained a variety of waste materials, and PCBs were detected at a range of concentrations, some in excess of 100 milligrams per kilogram (mg/kg) (PAP-00214426).

PCBs were detected at concentrations below 1 mg/kg throughout the site in surface and subsurface soils. Detections greater than 1 mg/kg were primarily located in the northwest corner of the site (PAP-00717667-8).¹

AOC 107 was identified as the Spill Location on Street North of Building 100. On March 2, 1991, a 10-15 gallon, 100-foot trail of PCB-contaminated transformer oil was released to the roadway due to a broken valve during a transformer relocation by an outside contractor. Federal and state authorities were notified and the area was cleaned by Roche’s personnel (PAS-00003177).

Upon the demolition of Building 86 in 2005, Roche sampled demolition debris being used as fill and found that concrete, caulking, paint, and other materials contained PCBs. Two hotspot locations (>50 mg/kg) were identified and excavated and were disposed offsite at appropriate licensed disposal facilities. Engineering controls in the form of layers of sand and geotextile, aggregate, and asphalt, and a deed notice were implemented (PAP-00189813-4).

¹ This Report was revised to include information contained in documents received on May 19, 2020. The additional documents did not change Hoffmann-LaRoche’s previous certification.

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PAHs were detected throughout the site in subsurface soils (PAP-00717657-62).²

AOC 105 was identified as the Building 61 Pump House and Appurtenant Piping (Memorandum of Agreement (MOA) IA-4). This area was located in the northern portion of the facility. The building pumped No. 6 fuel oil from the 640,000-gallon aboveground storage tank (AST) located in the northern corner of the facility to the Building 39 boiler house. Historically, the oil transfer pipe was buried directly in the ground. In 1989, the underground line was removed from service and replaced with an aboveground line. This aboveground line was inspected regularly by Roche's personnel. On December 18, 1989, Roche's personnel discovered No. 6 fuel oil in a storm water catch basin on the south side of the facility. The underground line which carried fuel oil from the 640,000-gallon AST to Building 39 had developed a leak in the vicinity of the pump house (Building 61) and oil had flowed into the storm sewer system. At that time this storm sewer was being routed through Roche's pretreatment facility and no oil was discharged to surface water (PAS-00003171).

There were several releases of fuel oils to shallow soils in the immediate vicinity of fuel storage facilities. The following PAHs were detected at the Roche facility at AOC 155 at depths of 4.5-4 feet below ground surface (bgs) collected on February 20, 2002 (PAS-00101494, PAS-00123427):

- Benzo(a)anthracene – 11 mg/kg
- Benzo(a)pyrene – 8.5 mg/kg
- Benzo(b)fluoranthene – 11 mg/kg
- Benzo(k)fluoranthene – 4.6 mg/kg
- Dibenz(a,h)anthracene – 1.1 mg/kg
- Indeno(1,2,3-cd)pyrene – 4.7 mg/kg

Dieldrin

Dieldrin was detected at a maximum concentration of 0.0626 mg/kg in the concrete demolition materials at the former Building 86 (PAP-00189916). Engineering controls in the form of layers of sand and geotextile, aggregate, and asphalt, and a deed notice were implemented (PAP-00189813-4).

Lead

Lead was detected throughout the site in surface and subsurface soils at concentrations less than 10,700 mg/kg. Detections with concentrations above 10,700 mg/kg were almost exclusively located in the northwest corner of the site (PAP-00717663-4).²

² This Report was revised to include information contained in documents received on May 19, 2020. The additional documents did not change Hoffmann-LaRoche's previous certification.

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Hoffmann-La Roche used a lead catalyst that was coated with palladium in the manufacture of Vitamin A in Building 68 (in IA-3, in the northeastern part of the Site). All From 1960 through 1984, an average of 1,760 kilograms (kg) per year of lead acetate was used (PAS-00002944). Lead was detected in soil samples collected at location TP-01-03 from the Proposed Daycare Center Area 2 at a concentration of 3,080 mg/kg (PAS-00101356).

Roche purchased the northwest corner of the site (referred to as northern IA-10) in 1967 (PAP-00215458). This parcel included a former industrial fill area; the filling preceded Roche's purchase. The former industrial fill area contained a variety of waste materials, and lead was detected as high as 153,000 mg/kg (PAP-00214421).

Copper

Small amounts of copper sulfate (average of 616 pounds per year) were purchased for use in production (PAS-00002942).

Mercury

Mercury was detected throughout the site in surface and subsurface soils at concentrations less than 65 mg/kg. The few detections with concentrations above 65 mg/kg were not located together (PAP-00717665-6).

AOC 109 was identified as the Mercury Release Underground Tunnel Building 56 (identified in MOA as IA-5). Mercury (1-2 ounces) was identified by a contractor during tunnel upgrade activities under Building 56. The material was recovered by Roche's personnel (PAS-00003179).

Soil samples were collected in AOC 174 (which was the proposed daycare center Area 2) to assess environmental conditions during a project to site a potential Roche-operated daycare center. This area was located on Roche-owned parcels west of the Conrail easement within Parking Lot 900 Annex and east and south of the former Roche Buildings 111 and 112. Roche had never utilized the subject parcels for pharmaceutical/chemical manufacturing, although, former property owners may have conducted manufacturing operations. Mercury was found at location EB-111-16-2 in Area A at a concentration of 18.5 mg/kg, which exceeded the highest background value reported for inorganic datasets from urban background and New Jersey state-wide background concentrations (PAP-00213097, PAS-00101356).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.³

³ *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, <https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm>, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

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The New Jersey Department of Environmental Protection (NJDEP) has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.⁴ Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.⁵ PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.⁶

According to a Preliminary Assessment/ RCRA Facility Assessment Report dated May 1998, an assessment of non-indigenous fill “failed to reveal any evidence that non-indigenous fill material was brought to the Roche site to raise topographic elevations or to replace indigenous soils” (PAP-00067784).

Based on a Remedial Investigation (RI) report for Investigative Area No.15 (IA-15), located in the southeast corner of the site, an evaluation of soil boring logs for IA-15 in conjunction with prior investigations performed at adjacent IA-14 determined that historic fill material is present throughout this entire area and appears to extend beyond the IA-15 boundary. IA-15 comprises Tax Block 2101, Lot 1. Kingsland Street borders IA-15 to the north/northwest, IA-14 to the east/northeast, St. Paul’s Brook and commercial establishments to the south, and a Conrail railroad line to the west/southwest. Fill material, including bricks, concrete, asphalt, coal/ash, wood and black granular debris are present and widespread over much of the area and ranged in thickness from four feet to 12 feet, with the thickness increasing as the bedrock surface slopes downward towards the south. Fill material across the IA has been reworked during construction of the former buildings and installation of the numerous process, storm sewer and sanitary sewer lines and subsurface vaults associated with the Environmental Control Facility (ECF) (PAP-00068195-96).

According to the Remedial Investigation Report, Investigative Area 11, A total of 13 AOCs 10a, 10b, 28, 58, 59, 67, 116, 164, 165, 173, 181, 188 and the stockpiled Soil Area (no AOC designation) were identified in IA-11 (PAP-00068768). Historic Fill was identified over an extensive portion of IA-11 (PAP-00068770).

⁴ *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

⁵ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

⁶ NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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In addition, Roche purchased the northwest corner of the site (referred to as northern IA-10) in 1967 (PAP-00215458). The IA-10 site geology was described as historic fill material in the Remedial Investigation Report Investigative Area 10, dated December 19, 2013 (PAP-00214329). This parcel included a former industrial fill area; the filling preceded Roche's purchase. The former industrial fill area contained a variety of waste materials, and PCBs were detected at a range of concentrations, some in excess of 100 mg/kg (PAP-00214426). Lead was detected as high as 153,000 mg/kg (PAP-00214421). This former industrial fill area is one of six areas at the site where soils were not remediated and are subject to the Deed Notice (PAP-00215456; 465)

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00214421, PAS-00123427-8, PAP-00717657-62).⁷

COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	153,000 mg/kg
Copper	6,740 mg/kg
Mercury	18.5 mg/kg
Benzo(a)anthracene	>160 mg/kg
Benzo(a)pyrene	>120 mg/kg
Benzo(b)fluoranthene	>110 mg/kg
Benzo(k)fluoranthene	>93 mg/kg
Dibenzo(a,h)anthracene	>25 mg/kg
Indeno(1,2,3-cd)pyrene	>67 mg/kg

5. COC Pathways***Sanitary Sewer***

Since 1987, the Passaic Valley Water Supply Company and the Jersey City Water Company exclusively supplied water for all aspects of Roche's Nutley, NJ operations. These operations included: non-contact cooling water, production, sanitary and general uses. The amount of water used by the facility was generally equal to the amount of wastewater discharged to the local POTW. The Roche facility discharged approximately 1.8 million gallons of wastewater per day to the Passaic Valley Sewerage Commission (PVSC) under a local permit (PAS-00002877).

The Roche Nutley facility produced several different wastewater streams from site operations including sanitary wastewater, laboratory rinse water, non-contact cooling water, cooling tower blowdown, steam condensate, boiler blowdown and process wastewater. These wastewater streams, in addition to stormwater were managed by Roche to prevent unpermitted discharges to the waters of the State of New Jersey (PAS-0002877).

⁷ This Report was revised to include information contained in documents received on May 19, 2020. The additional documents did not change Hoffmann-LaRoche's previous certification.

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The Roche site is equipped with two types of sewer systems, process sewer system (commingled with the sanitary sewer) and the storm sewer system which is a completely separate sewer system from the process/sanitary sewer. Effluent discharges from these systems are permitted by the state of New Jersey under the following Roche permits:

- NJPDES/DSW Permit No. NJ0034185 for stormwater runoff commingled with noncontact cooling water (thermal water) discharge to St. Paul's Brook (DSN 002A) for the Roche property east of the Conrail railroad tracks and north of Kingsland Street.
- PVSC Sewer Connection Permit, Permit No. 24402882.
- NJPDES Industrial General Permit No. NJ0088315 for stormwater runoff from the area of the property west of the Conrail railroad easement (PAS-00101296-9). Stormwater from this area discharges directly to St. Paul's Brook upstream of DSN-002A (PAS-00002879, PAS-00101310).

The effluent from Roche to PVSC in August 1978, contained the following contaminants, with a flow rate of 6.304 million gallons per day (gpd): copper at 0.156 ppm, lead at 0.243 ppm, and mercury at 0.002 ppm (PAS-00123426).

It is known that stormwater from the main part of the facility east of the railroad easement was discharged to the City's stormwater system until 1982 when stormwater runoff was rerouted to St. Paul's Brook. In addition, facility drawings from the mid-1960s show that stormwater catch basins east of the railroad easement may have been connected to the Valley Drain, which is a sub-grade water body that flows from north to south through the approximate center of the facility. Having been developed separately from Roche's main facility, stormwater from areas west of the railroad easement (i.e., Building 103/104 area and Building 70 area) flowed into St. Paul's Brook. Process wastewater was channeled through subsurface pipes constructed of materials such as glass, vitrified clay or asbestos concrete which converged at the southern portion of the site. Following the construction of the lime house (Building 47) in the late 1940s, process wastewater was neutralized before it was discharged to the municipal/sanitary wastewater system (PAS-0002878).

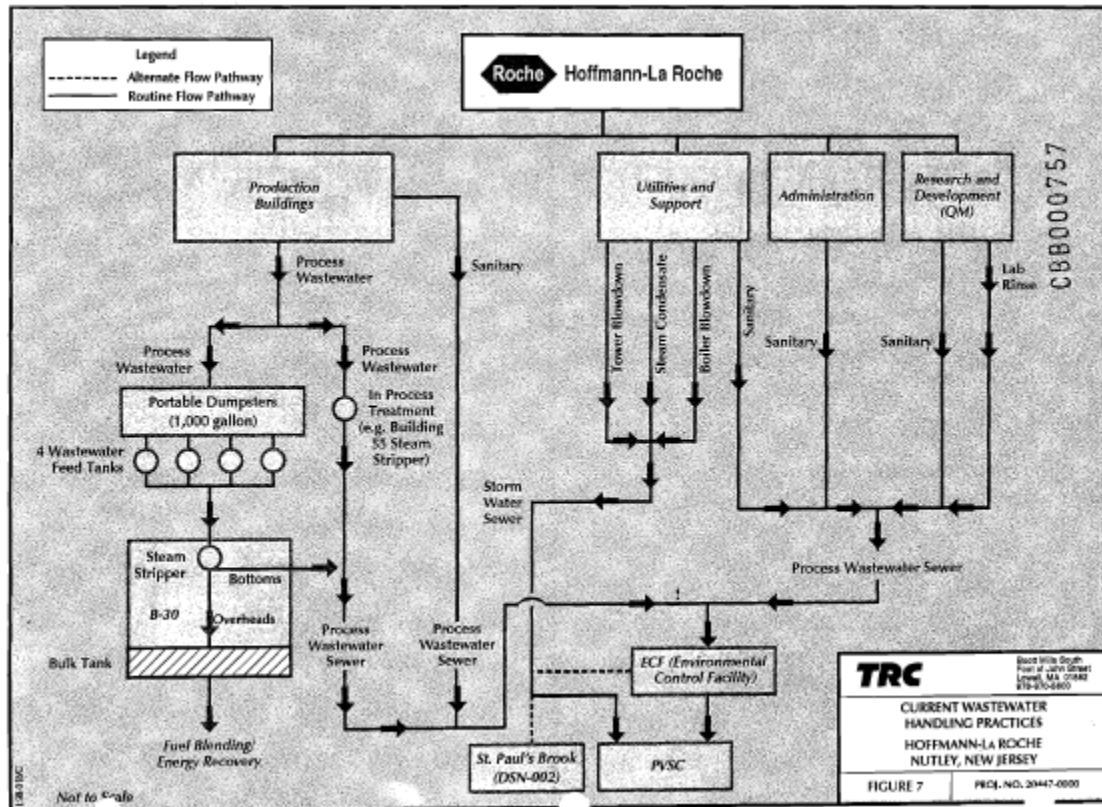
Prior to the construction of Roche's ECF in 1982, all of Roche's wastewater was discharged through piping to the city sewer system south of Roche's Kingsland Street entrance. However, this pipe is currently plugged. Roche maintains several regulatory required environmental management plans, including an Industrial Stormwater Pollution Prevention Plan, and a combined Discharge Prevention, Containment and Countermeasure (DPCC), Spill Prevention Control and Countermeasure (SPCC), and Discharge Cleanup and Removal (DCR) Plan. Roche has also developed comprehensive Environmental Health and Safety Standard Operating Procedures (SOPs) and Preventative Maintenance Programs to maintain compliance with a wide-array of environmental regulations. The Environmental Health and Safety SOPs include detailed management practices for solid and hazardous waste management throughout the facility (PAS-0002878-9).

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The majority of the process sewer lines lie west of the Valley Drain, where historically the majority of production occurred at the facility. Process sewer lines from the western and eastern halves of the facility converge immediately north of Building 47. From there, the process sewer follows Kingsland Street to the ECF. Process wastewater passed through steam stripping units to reduce/eliminate the solvent loads before the wastewater was discharged to the process sewer. The primary stripping unit was located within Building 30. Wastewater from various production buildings was collected in portable 1,000-gallon tanks (dumpsters) that were located directly outside each production building. On a regular basis (typically within 72 hours of filling), Roche personnel transported the dumpsters to Building 30 where the water was transferred to several wastewater feed tanks. The feed tanks fed into the steam stripping unit. The solvent overheads were directed to a bulking tank and sent offsite for fuel blending in cement kiln operations. The steam stripper bottoms were discharged to the process sewer. Other process wastewater (e.g., from Building 55) was treated in steam stripping units located within the process building itself. Solvents recovered during this operation were recycled for reuse in the process. Wastewater was then discharged to the process sewer. The process sewer system drained wastewater generated from all facility buildings through service connections from all areas of the plant. Process wastewater was gravity fed through the subgrade piping network to Building 47. From there, the sewer pipes left the property and ran along Kingsland Street to Roche's ECF (PAS-00002880-81).



(PAS-00003018)

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Facility Data Report***Storm Sewer and Catch Basins***

Stormwater from the main part of the Roche facility east of the railroad easement was commingled with non-contact cooling water, steam condensate, and cooling tower blowdowns. During periods of light precipitation or during low flow conditions, the commingled flow was combined with the process sewer wastewater and discharged to the PVSC. During large rain events, Roche was permitted to discharge non-contact cooling water and runoff to St. Paul's Brook at Outfall 002A under NJPDES-DSW Permit No. NJ0034185. Roche's discharge records stated that the last time stormwater was discharged to St. Paul's Brook through Outfall 002A was June 1992.

An Application for Permit to Discharge Wastewater dated January 31, 1990, for Outfall 001, reports that approximately 3.59 million gpd were discharged to the PVSC sewage treatment plant, including 1,142,500 gpd from chemical production, 141,000 gpd from pharmaceutical production, 1,220,000 gpd from utilities and maintenance and 443,850 gpd from stormwater and cooling water (PAP-00717651).⁸

Roche also utilized the Insituform process to reline portions of the storm sewer system that lies beneath production areas both west and east of the Valley Drain. Roche maintained a separate storm sewer system for areas west of the railroad easement (Building 104/103 and Building 70 area). Areas west of the easement were used for administration support and to house general equipment and raw materials warehousing. Roche maintained a General Permit, NJPDES Permit No. 0088315 for discharge of storm water runoff directly into St. Paul's Brook for this area (PAS-00002882). Roche's ECF is located south of Kingsland Street and was identified as Building 116. Roche's ECF was brought online in the summer of 1982. Prior to that time, all process water was channeled through Building 47 where lime and sulfuric acid were used to adjust pH prior to discharge into the municipal sanitary sewer. The ECF was a pretreatment facility that was designed to provide flow equalization, pH neutralization and spill control for treatment of wastewater prior to its discharge to the PVSC Treatment Works. Although Roche maintained both a Sewer Connect Permit (Permit No. 24402882) for discharge of wastewater to the PVSC, and a New Jersey Pollutant Discharge Elimination System (NJPDES) permit (permit No. NJ0034185) for discharge to St. Paul's Brook, all process water, and storm water from the main part of the facility, located east of the Conrail tracks was discharged to PVSC since 1992. Roche carefully monitored the storm water and process sewer systems for releases of volatile organic compound materials using on-line lower explosive limit (LEL) meters which were located within process sewer and storm water manholes. The process sewer system is equipped with 17 LEL meters located at various positions within the system. Six LEL meters were also positioned within the storm sewer system: 3 meters within the plant proper and 3 meters at the ECF. During normal operations, process wastewater entered the ECF through manhole PR-4. The wastewater was pumped through a skimmer/settler basin, through a flow equalization basin, and into a neutralization and attenuation basin, where it was neutralized with either magnesium hydroxide or sulfuric

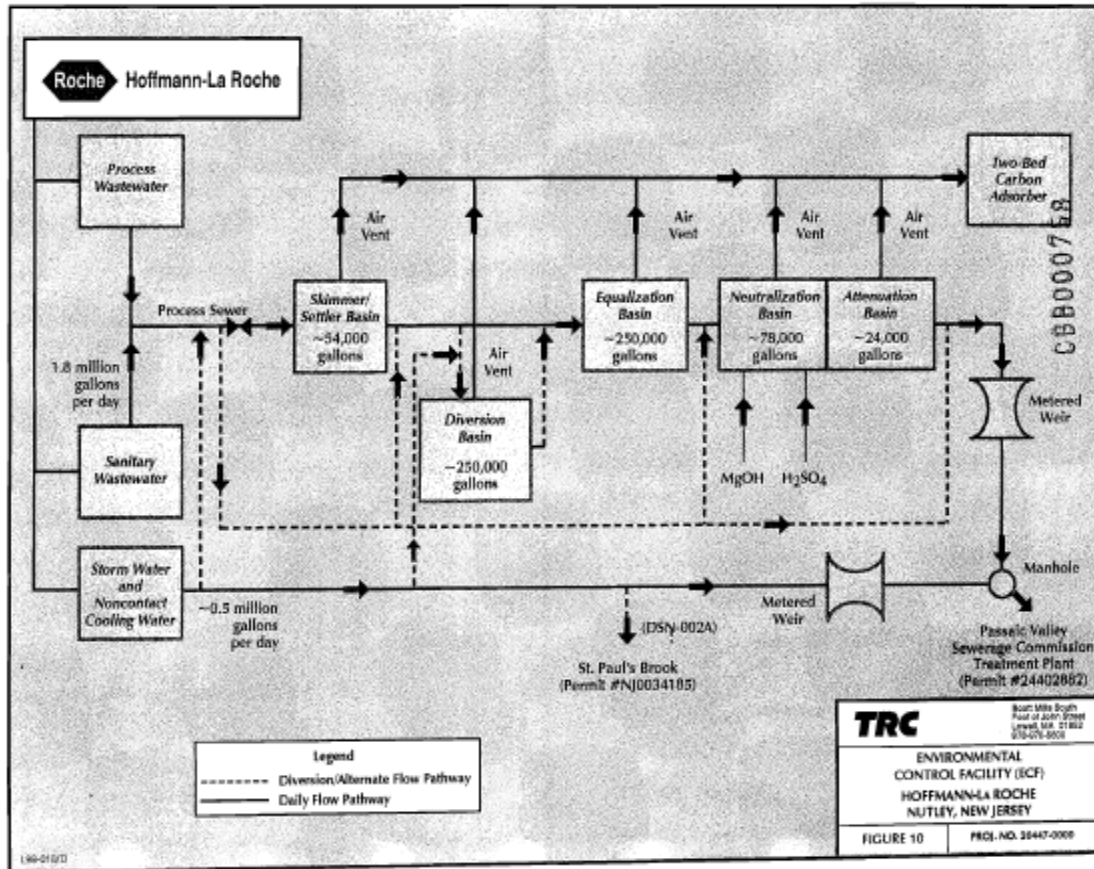
⁸ This Report was revised to include information contained in documents received on May 19, 2020. The additional documents did not change Hoffmann-LaRoche's previous certification.

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acid. From the neutralization basin, the water exited the facility and discharged through subgrade piping to PVSC's public treatment works.



(PAS-00003019)

Direct Release

During large rain events, Roche was permitted to send non-contact cooling water and runoff to St. Paul's Brook at Outfall 002A under the NJPDES-DSW Permit No. NJ0034185 (PAS-00002882).

6. Regulatory History/Enforcement Actions**Permits**

The facility had a NJPDES/DSW Permit No. NJ0034185 for stormwater runoff commingled with noncontact cooling water (thermal water) discharge to St. Paul's Brook (DSN 002A) for the Roche property east of the Conrail railroad tracks and north of Kingsland Street (PAS-00101310-322; PAS-00002879).

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During the period beginning “Modified EDP” and lasting through July 31, 1990, the permittee was authorized to discharge from discharge points designated as Outfalls DSN-001, DSN-003, DSN-004, and DSN-005. The discharge limitation for mercury (total) was 181 grams/day (PAS-00101514). In addition, the final permit was modified to delete the previous conditional limits and monitoring requirements for copper since the permittee did not use any corrosion inhibitors, biocides, or other cooling water additives containing this metal in its non-contact cooling water or cooling water blowdown (PAS-00101321-22).

The facility also held PVSC Sewer Connection Permit, Permit No. 24402882 (PAS-00002879).

Finally, the facility held NJPDES Industrial General Permit No. NJ0088315 for stormwater runoff from the area of the property west of the Conrail railroad easement (PAS-00101299, 305). Stormwater from this area discharges directly to St. Paul’s Brook upstream of DSN-002A (PAS-00002879).

Violations

On April 10, 1947, an inspector discovered oil on Nichol’s Pond, a tributary to Third River. The source was traced to Roche’s power plant upstream on Nichol’s Brook. It was found that a tank truck delivering fuel oil had a spill and lost approximately 100 gallon of fuel oil which escaped through a yard drain into the ditch along the railroad and into Nichol’s Brook. The inspector had the remaining oil cleaned from the yard, and most of the oil having collected in the railroad ditch, this accumulation was skimmed off and carted away (PAS-00101231; PAS-00123430).

On May 19, 2004, a leak was found in the excavation going to the storm drain. The substance released was “oil fue.l” The document states that cleanup was underway (PAS-00101278).

Spills

The following table summarizes known discharges and releases at the Hoffmann-La Roche Facility (note that not all of these releases may be related to releases of OU2 COCs):

Hoffmann- La Roche Discharges				
Date	Location	Media	Material Released	Estimated Amount
2/15/82	St. Paul’s Brook	Water/St. Paul’s Brook	No. 2 Fuel Oil	Undetermined
3/22/82	St. Paul’s Brook	Water/St. Paul’s Brook	Paint	Undetermined
8/30/82	Building 106	Soil	Waste Solvents	Undetermined
4/87	Building 68 USTs	Soil	Various Solvents	Undetermined

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Hoffmann- La Roche Discharges				
Date	Location	Media	Material Released	Estimated Amount
4/3/89	St. Paul's Brook	Water/St. Paul's Brook	Hydraulic Fluid	Undetermined sheen observed
12/18/89	Building 61 Area	Soil, groundwater	No. 6 Fuel Oil	Undetermined
1991	Building 35 USTs	Soil, Groundwater	Various Solvents	Undetermined
3/2/91	Street – Building 100	Not applicable	PCB transformer oil	10 gallon
2/92	Building 100 UST	Soil	Fuel Oil	Undetermined
2/92	Building 86 USTs	Groundwater	Fuel Oil	Undetermined
2/92	Building 102	Soil	Fuel Oil	Undetermined
2/10/92	Building 110 UST	Soil/Groundwater	No. 2 Fuel Oil	Undetermined/Soil remediated
2/20/92	Building 47 UST	Soil	No. 2 Fuel oil UST	Undetermined
7/29/92	Tunnel between B-44 and 56	Soil	Mercury	2-3 milliliters
8/92	Building 39 USTs	Soil	Fuel Oil	Undetermined
6/8/95	Building 1	Soil	Hydraulic Oil	1 gallon
1/96	Process Sewer Line	Soil	Process Wastewater	Undetermined
5/29/96	Parking Lot 500 Annex	Not applicable	Hydraulic oil	1 pint
11/97	Building 118	Soil	Diesel Fuel	~ 1 gallon

(PAS-00002988-89)

AOC 105 was identified as the Building 61 Pump House and Appurtenant Piping (Memorandum of Agreement (MOA) IA-4). This area was located in the northern portion of the facility. The building pumped No. 6 fuel oil from the 640,000-gallon AST located in the northern corner of the facility to the Building 39 boiler house. Historically, the oil transfer pipe was buried directly in the ground. In 1989, the underground line was removed from service and replaced with an aboveground line. This aboveground line was inspected regularly by Roche's personnel. On December 18, 1989, Roche's personnel discovered No. 6 fuel oil in a storm water catch basin on the south side of the facility. The underground line which carried fuel oil from the 640,000-gallon AST to Building 39 had developed a leak in the vicinity of the pump house (Building 61) and oil had flowed into the storm sewer system. At that time this storm sewer was being routed through Roche's pretreatment facility and no oil was discharged to surface water (PAS-00003171).

AOC 107 was identified as the Spill Location on Street North of Building 100. On March 2, 1991, a 10-15 gallon, 100-foot trail of PCB-contaminated transformer oil was released to the roadway due to a broken valve during a transformer relocation by an outside contractor. Federal and state authorities were notified and the area was cleaned by Roche's personnel (PAS-00003177).

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AOC 109 was identified as the Mercury Release Underground Tunnel Building 56 (identified in MOA as IA-5). Mercury (1-2 ounces) was identified by a contractor during tunnel upgrade activities under Building 56. The material was recovered by Roche's personnel (PAS-00003179).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Heavy Metals Source Determination Study*, Appendix A, Industrial Waste Surveys, Part A – Industrial Site Interviews, Volume 3, dated August 15, 1978
- *Direct Discharge PRP Cases for the Lower Passaic River Study Area*, Hoffmann-La Roche, dated August 22, 2005 (PAS-00101228)
- *Remedial Action Report, Concrete Demolition Materials Contamination MOA Investigative Area 6*, Hoffmann-La Roche, Nutley/Clifton, Essex/Passaic County, PI No. 009949, dated September 2012 (PAP-00189811)
- *Remedial Investigation Report for Investigative Area 10 (IA-10)*, dated December 19, 2013 (PAP-00214315)
- *Ecological Evaluation and Surface Water Remedial Investigation Report*, Hoffmann-La Roche Inc., dated April 2014 (PAP-00214766)
- *Soil Remedial Action Permit Modification*, dated March 2018 (PAP-00215482)
- *PRP Data Extraction Form, Lower Passaic River Study Area* (PAS-00123422)

Sewer

There is no information regarding sewer sampling in the available file material.

Soil

Roche purchased the northwest corner of the site (referred to as northern IA-10) in 1967 (PAP-00215458). This parcel included a former industrial fill area; the filling preceded Roche's purchase. This former industrial fill area contained a variety of waste materials, and PCBs were detected at a range of concentrations, some in excess of 100 mg/kg (PAP-00214426). Lead was detected as high as 153,000 mg/kg (PAP-00214421).

Sediment

According to the surface water and sediment data collected, Roche's operations did not have an impact on St. Paul's Brook, and that contaminants detected in the Brook are the result of runoff from roads and urbanized surrounding areas. Concentrations of COCs adjacent to and downstream of the site were comparable to background concentrations. St. Paul's Brook did not transport COCs from the Roche Site to the Third River (PAP-00214764-831).

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The table below provides a complete list of COCs detected in sediment (PAP-00214806-807):

Parameter (mg/kg)	Site-Wide Sediment Data (organic) above ESC														
	ESC		Background			Site Data Summary				Frequency					
	LEL	SEL	Background Mean	Background Max	Background Mean x10	n	Min. Conc.	Max. Conc.	Avg. Conc.	# Detected	# > LEL Limit	# > SEL limit	# > Background Mean	# > Background Max	# > Background Mean x10
2-Methylnaphthalene	0.07	--	0.087	0.35	0.872	35	0	0.287	0.015	6	2	--	1	0	0
Acenaphthene	0.016	--	0.388	1.03	3.88	52	0	0.874	0.104	45	39	--	3	0	0
Acenaphthylene	0.044	--	0.038	0.099	0.383	52	0	0.215	0.04	42	14	--	17	5	0
Anthracene	0.22	3.7	0.927	2.41	9.27	52	0	1.74	0.328	50	20	0	5	0	0
Benzo(a)anthracene	0.32	14.8	3.07	5.73	30.7	52	0.029	9.22	1.19	52	39	0	5	3	0
Benzo(a)pyrene	0.37	14.4	2.7	4.77	27.0	52	0.035	9.03	1.16	52	35	0	6	3	0
Benzo(b)fluoranthene	10.4	--	3.96	6.95	39.6	52	0.062	13	1.6	52	1	--	4	3	0
Benzo(ghi)perylene	0.17	3.2	1.71	2.85	17.1	52	0.029	4.35	0.681	52	38	2	5	3	0
Benzo(k)fluoranthene	0.24	13.4	1.42	2.62	14.2	52	0.016	3.98	0.552	52	31	0	4	3	0
bis(2-Ethylhexyl)phthalate	0.182	0.75	5.12	13.4	51.2	41	0	94.6	3.47	38	23	9	2	2	1
Chrysene	0.34	4.6	3.84	6.71	38.4	52	0.042	10.3	1.38	52	39	3	4	3	0
Dibenz(a,h)anthracene	0.06	1.3	0.433	0.793	4.33	52	0	1.24	0.184	49	38	0	6	3	0
Fluoranthene	0.75	10.2	8.83	16.7	88.3	52	0.051	20.2	3.05	52	37	3	3	2	0
Fluorene	0.19	1.6	0.49	1.24	4.9	52	0	0.941	0.138	47	11	0	4	0	0
Indeno(1,2,3-cd)pyrene	0.2	3.2	1.95	3.28	19.5	52	0.026	5.3	0.778	52	37	3	5	3	0
Naphthalene	0.16	--	0.039	0.094	0.391	52	0	0.764	0.027	22	1	--	5	2	1
Phenanthrene	0.56	9.5	5.77	12.3	57.7	52	0.026	10.1	1.67	52	30	2	4	0	0
Phenol	0.049	0.048	0.077	0.33	0.774	35	0	0.133	0.004	1	1	1	1	0	0
Pyrene	0.49	8.5	6.53	11.9	65.3	52	0.06	16.5	2.44	52	40	3	6	2	0
Total PAHs	4	100	42.2	79.3	422	52	0.458	106	15.3	52	38	1	5	2	0
4,4'-DDD	0.008	0.06	0.006	0.01	0.062	43	0	0.047	0.008	39	14	0	18	10	0
4,4'-DDE	0.005	0.19	0.003	0.007	0.028	51	0	0.238	0.014	46	20	1	29	16	5
4,4'-DDT	0.008	0.71	0.003	0.005	0.035	35	0	0.017	0.005	31	9	0	23	15	0
DDT (Total)	0.007	0.12	0.013	0.019	0.125	57	0	0.241	0.029	53	40	6	25	15	5
Dieldrin	0.002	0.91	0.008	0.019	0.081	35	0	0.023	0.005	24	21	0	7	1	0
Heptachlor epoxide	0.005	0.05	0.0006	0.003	0.006	42	0	0.006	0.001	11	3	0	11	7	2

(PAP-00214806)

Parameter (mg/kg)	Site-Wide Sediment Data (inorganic) above ESC														
	ESC		Background			Site Data Summary				Frequency					
	LEL	SEL	Background Mean	Background Max	Background Mean x10	n	Min. Conc.	Max. Conc.	Avg. Conc.	# Detected	# > LEL Limit	# > SEL limit	# > Background Mean	# > Background Max	# > Background Mean x10
Arsenic	6	33	2.82	5.2	28.2	52	1.2	15.5	5.23	52	12	0	40	18	0
Cadmium	0.6	10	1.62	4.1	16.2	52	0.1	6.1	0.928	52	25	0	6	2	0
Chromium	26	110	73.1	162	731.1	52	5.3	70.6	25.4	52	18	0	0	0	0
Copper	16	110	93.7	252	937	52	6	261	53.7	52	47	4	5	1	0
Lead	31	250	239	1130	2392	52	5.8	676	98.1	52	41	3	3	0	0
Manganese	630	1100	164	299	1636	52	61.6	1630	423	52	13	3	43	28	0
Mercury	0.2	2	0.076	0.16	0.761	63	0	1.2	0.19	62	20	0	39	24	3
Nickel	16	75	19.1	30.4	191	52	5.9	57.4	19.2	52	31	0	21	5	0
Silver	1	--	0.69	3.1	6.9	52	0	3.6	0.593	38	7	--	17	1	0
Zinc	120	820	303	514	3026	52	24.8	819	163	52	28	0	3	2	0

(PAP-00214807)

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8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

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Facility Name, Address and Size: Allied-Signal, Inc., Dundee Warehouse, 65 Lodi Street at Eighth St., Passaic, New Jersey; Block 1029, Lot 25 (PAP-00101453; PAS-00047956); approximately 2 acres (PAP-00198137, PAP-00198138; PAP-00456821). No information for the number of workers and shifts was available in the file material.

1. **Business Type:** Nitrating plant until 1960, and bulk acid distribution facility until 1974 to 1976. After 1976, the facility was used by Allied-Signal, Inc. (Allied-Signal) as a storage facility for engineered plastics and pellets (finished products only) (PAS-00047823).

2. **Time Period of Ownership/Operations**

Operator: 1899 - 1987 (General Chemical/Allied Chemical & Dye Corporation/Allied-Signal, Inc./Honeywell)

Owner: 1899 - 1987 (General Chemical/Allied Chemical & Dye Corporation/Allied-Signal, Inc./Honeywell)

1899: General Chemical Company purchased the site from Dundee Chemical Works on February 25, 1899 (PAP-00198129).

1915: General Chemical Company granted a portion of the site on Eighth Street and south of the General Chemical Company to Paterson Parchment Paper Company on May 14, 1915 (PAP-00198135).

1954: Allied Chemical & Dye Corporation granted a portion of the site on Eighth Street to Donori Corporation on August 30, 1954. General Chemical Company is noted to be the predecessor to Allied Chemical & Dye Corporation (PAP-00198148). A site map showed Donori Corporation was located east of the Dundee Warehouse (PAS-00048059).

1987: Allied Corporation sold facility site to Anthony R. and Elaine Triolo on May 18, 1987 (PAP-00198137-38), who subsequently sold the site to Charles Cangialosi (PAP-00198139-40).

1988: According to an Environmental Cleanup and Responsibility Act (ECRA) Inspection performed on December 8, 1988, Tri-State Building Products was the new owner operating at the facility (PAS-00047956).

3. **Operational History/COC Use and Presence at the Facility**

According to the *ECRA Sampling Plan*, dated January 1987 (ECRA Sampling Plan), Allied-Signal had owned and operated the Dundee Warehouse facility since approximately 1899. The facility operated as a bulk acid distribution facility and a nitrating plant through 1960, when the nitrating operations were discontinued. The acid distribution operations were discontinued in 1974 through 1976. From 1976 through 1986, the facility was used for storage of finished plastic products (i.e., engineered plastics and pellets, such as AC Polyethylene®, Capron [Nylon]® and high density

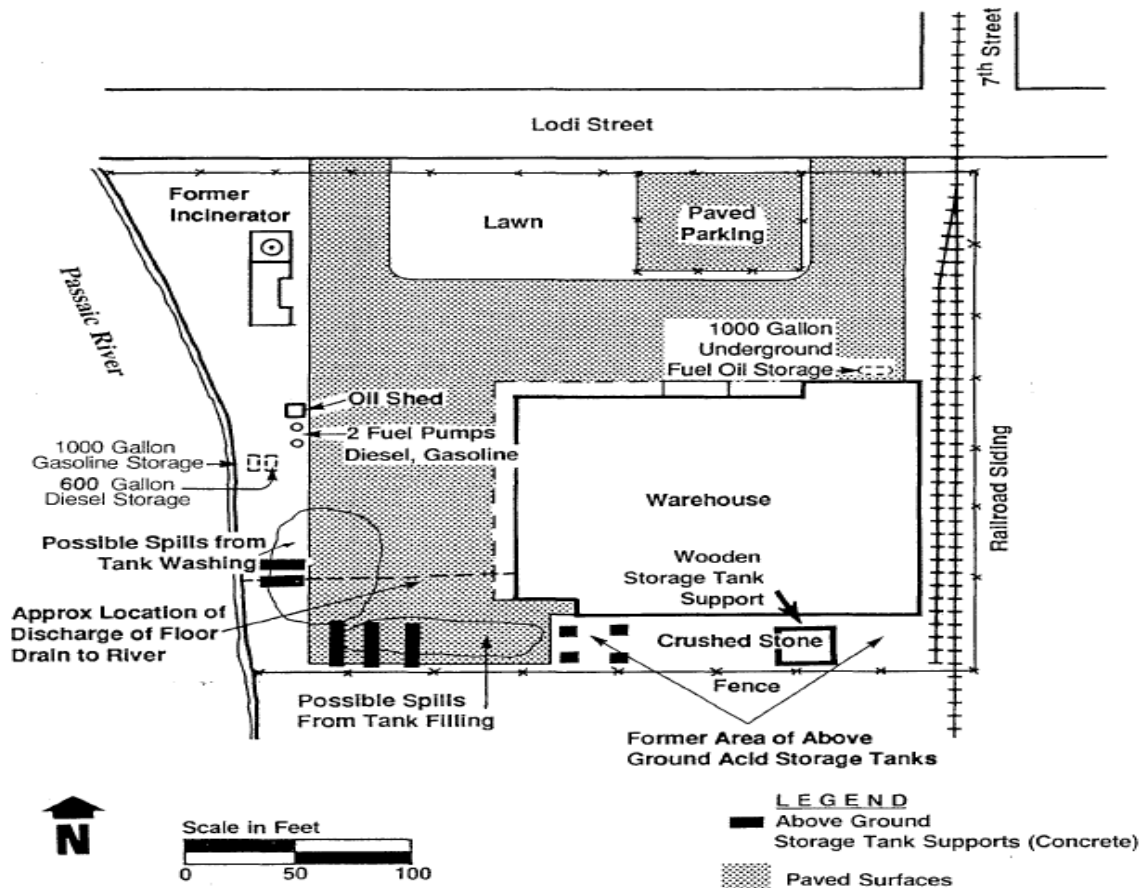
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polyethylene). At the time of the 1987 ECRA Sampling Plan, all on-site activities had been discontinued and the warehouse was vacant (PAP-00197580, 83).

A facility site map from the 1987 ECRA Sampling Plan is included below:



(PAP-00197582)

Note the potential presence of the discharge of the floor drain to the Passaic River as depicted on this figure is discussed in Section 5, Potential COC Pathways.

Hazardous substances reportedly present at the facility and listed in the ECRA Sampling Plan included fuel oil (1,000-gallon subsurface storage tank) and diesel fuel (600-gallon subsurface storage tank) (PAP-00197581). Although the specific processes used at the facility were not identified in the available in the file material, a general description of nitric acid production in the early 1900s was provided. The book *Manufactures 1905, Part IV Special Reports on Selected Industries*, from the Department of Commerce and Labor Bureau of the Census, stated that nitric acid was made commercially by distilling sodium nitrate with sulfuric acid. Sulfuric acid from the "lead pan evaporation" was reported to be used to obtain weaker grades of nitric acid (PAP-00432529-30). According to this reference, the byproduct of this process was a nitre cake, composed of sodium hydrogen sulfate or sodium bisulfate (PAP-00432532).

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According to the Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, dated January 1995, nitric acid production also utilized high temperature catalytic oxidation of ammonia over a platinum catalyst. The Sanborn map from 1899 identified "platinum concentrators" adjacent to the "lead acid pans" in the "Sulphuric Acid Chambers" (the same building as the Warehouse in the figure above) (PAP-00445860). This type of process starts with the oxidation of ammonia to create nitric oxide, followed by subsequent further oxidation to nitrogen dioxide, then separation and purification steps. Potential byproducts of this process are water, nitrogen tetroxide, and gaseous nitrogen oxides (PAP-00432459-61, PAP-00432464-67). While lead was not identified as used in the nitric acid production process, historical Sanborn facility maps from 1899, 1903, and 1910 (show the presence of lead-lined acid storage tanks and lead-lined acid pans known to be used in acid production (PAP-00445860-2).

The *Soil Investigation, Report of Findings*, dated December 5, 1989 (1989 Soil Report), and the *Determination of Ambient Site Conditions and Phase II Supplemental Sampling Report of Findings*, dated April 29, 1991 (1991 Phase II Report) summarized the results of sampling of 10 areas at the site. The areas as well as the chemicals of concern (COCs) that were detected include the following (note: concentrations are provided in the COC-specific portions of Section 4, Identified COCs):

- Sample Area A was characterized by the former presence of subsurface gasoline and diesel storage tanks. Soil sampling results detected maximum concentrations of PAHs at sampling location 1 Mid (depth of 18 to 24 inches) (PAP-00101532).
- Sample Area B was utilized for both tank washing and above ground acid storage (PAP-00101534-35). Lead and polycyclic aromatic hydrocarbons (PAHs) were detected in soils in this area with the highest concentrations in soil sample B-2 (I) and B-3 (I) respectively collected at 3 ft bgs (PAS-00047242).
- Sample Area C was a tank truck delivery area. Raw materials handled in this area included hydrochloric acid, sulfuric acid, ammonia, and liquid silicates (PAP-00101536).
- Sample Area D was the former location of aboveground acid storage tanks (PAP-00101536).
- Sample Areas E and F were characterized by the presence of surficial soil staining (PAP-00101539). The maximum lead concentration in these areas was detected in subsurface soil (PAS-00047239-41).
- Sample Area G was the former location of a small utility shed used for the storage of small quantities of gasoline and motor oil (PAP-00101539). Lead was detected at a maximum concentration in subsurface soil in this area (PAS-00047240).

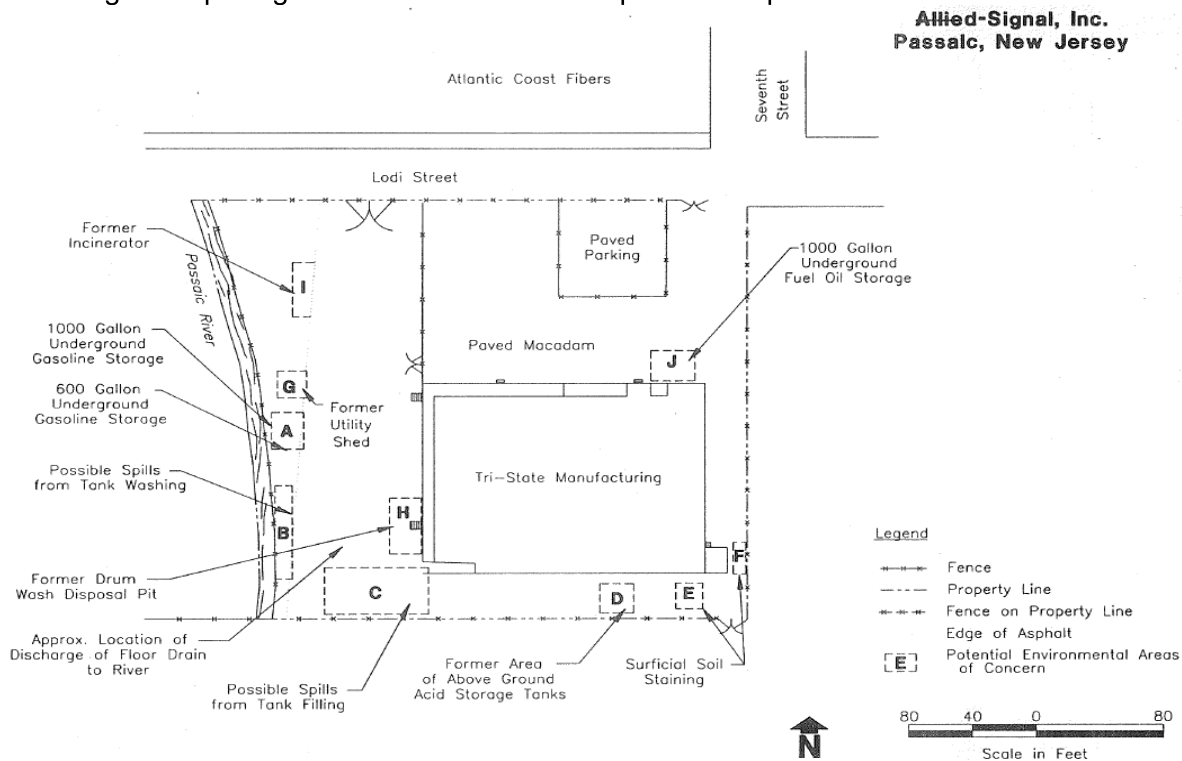
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- Sample Area H contained a former drum wash disposal pit that had been filled with cement, preventing access to the pit. The maximum mercury concentration in this area was detected at a depth of 7 to 8 feet below ground surface (ft bgs). PAHs were stated to have been detected at "low concentrations" (PAP-00101543-44). Samples were also collected upstream and downstream of a suspected pipe discharge. The referenced report stated that mercury and lead were detected in the upstream sample (identified as H4) and should, therefore, be considered as occurring as background contamination (PAP-00101546). Note that the subsequent *Report of Findings, Determination of Ambient Site Conditions and Phase II Supplemental Sampling*, dated April 29, 1991 (1991 Phase II Report) identified H5 as the upstream sample (PAS-00109682). Based upon the location of the samples in the figure on PAP-00101545 and the site layout figure above, the site is located at a jog in the Passaic River and H5 was located upstream of H4.
- Sample Area I was the former incinerator. Soil sampling identified maximum concentrations of copper and mercury in surface sample I4 (0 to 6 inches) (PAP-00101546-48). Lead was detected at maximum concentration in surface soil and PAHs were detected at maximum concentrations in subsurface soil in this area (PAS-00047227, 242).
- Sample Area J was characterized by the presence of an abandoned 1,000-gallon underground storage tank (UST) used for storage of fuel oil (PAP-00101548-50).

A figure depicting the location of each Sample Area is presented below:



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The loading docks were located approximately 100-125 feet east of the Passaic River (PAP-00197571). The gasoline and diesel underground storage tanks (USTs) were located along the river (PAP-00101478).

4. Identified COCs

- PAHs (used, detected)
- Lead (used, detected)
- Copper (detected)
- Mercury (detected)

PAHs

USTs containing diesel fuel (600-gallon UST) and fuel oil (1,000-gallon UST) were identified in the ECRA Sampling Plan. Precision testing performed in 1986 found that the diesel and fuel oil tanks were tight. An oil shed and fuel pumps for the diesel and gasoline were also identified on site. In addition, oil staining was noted on the floor of the utility shed (PAP-00197582-83). On June 2, 1987, the diesel UST was excavated and removed (PAP-00101478). PAHs were detected in the samples collected from 18 to 24 inches beneath the base of the excavation, with the highest concentrations from beneath the diesel tank (PAP-00101479, 82).

Based on the ECRA investigations performed in the late 1980s and early 1990s, PAHs were detected at several investigative areas. Maximum detected concentrations in surface soil (0-0.5 ft bgs) at each area are provided in the following table:

Maximum PAH Concentrations in Surface Soil (0-0.5 ft bgs)			
Area	B	H	I
Sample	B1	H5*	I4
benzo(a)anthracene	6.0	2.9	7.91
benzo(a)pyrene	5.0	2.1	9.23
benzo(b)fluoranthene	3.8	1.8	9.82
benzo(g,h,i)perylene	2.8	1.1	6.90
benzo(k)fluoranthene	4.2	1.5	6.84
chrysene	5.6	2.8	8.90
dibenzo(a,h)anthracene	1.2	ND	2.33
fluoranthene	10	5.5	11.4
indeno(1,2,3-cd)pyrene	ND	1.2	5.97
pyrene	17	4.5	11.2
Source	(PAP-00101556)	(PAP-00101554)	(PAP-00101560)

All results in mg/kg
ND: Not Detected

*This is a sediment sample collected from 0.5-1 ft bgs upstream from a suspected discharge pipe (PAP-00101543, 46; PAS-00109682).

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The *Supplemental Project Tasks, Former Allied-Signal, Dundee Warehouse, Passaic, New Jersey, ECRA Case Number 87133*, dated January 8, 1992 (Supplemental Project Tasks Letter) estimated that the volume of soil in Area B that contained residual carcinogenic PAH compounds above the New Jersey Department of Environmental Protection (NJDEP) soil cleanup guideline of 2.5 mg/kg was approximately 22 cubic yards (PAS-00048047). In addition, the *Focused Feasibility Study and Cleanup Plan*, dated September 15, 1992 (1992 Cleanup Plan), calculated the volume of soil impacted by carcinogenic PAHs to be 47.4 cubic yards (PAP-00101433).

The *Remedial Action Report*, dated June 1994 (1994 RAR), stated that elevated concentrations of base neutral compounds in Area B may be a result of the historical operation of the site (PAS-00047832). In addition, an NJDEP approval letter, dated May 4, 1993, for the 1992 Cleanup Plan noted that the base neutral contamination detected during the August 1989 sampling event at sample locations B-1 (Area B) and I-1, I-3, and I-4 (Area I) appeared to be related to previous site operations (PAP-00101455-56).

PAHs were also detected in subsurface soil at Area A (former USTs) and Area I (former incinerator):

Maximum PAH Concentrations in Subsurface Soil			
Area	A	A	I
Sample (depth)	1M (18")	SB6 (12-14")	I2 (3')
benzo(a)anthracene	139	88	8.1
benzo(a)pyrene	21.1	70	9.7
benzo(b)fluoranthene	109*	68	10.2
benzo(g,h,i)perylene	28.7	37	6.8
benzo(k)fluoranthene	*	50	5.8
chrysene	136	93	8.0
dibenzo(a,h)anthracene	ND	21	2.8
fluoranthene	293	371	9.5
indeno(1,2,3-cd)pyrene	20.2	32	4.9
pyrene	346	156	11.9
Source	(PAP-00101552)	(PAP-00102029)	(PAP-00102026)

All results in mg/kg

ND: Not detected

*The isomers benzo(b)fluoranthene and benzo(k)fluoranthene could not be chromatographically separated under the analyte conditions for these samples. Therefore, the reported concentrations represent the total of these two isomers (PAP-00101552).

Copper

Sample Area I soil results identified copper at a maximum concentration of 257 mg/kg in surface sample I4 (PAP-00101548, 60).

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Lead

Lead acid pans were located at the northwest corner of the warehouse building in the 1899 and 1903 Sanborn maps, but were "sulphur furnaces" in the 1910 map. The lead acid tank was located between the lead acid pans and the Passaic River in the 1899, 1903, and 1910 maps. A structure at the same location was present in the 1935 Sanborn map, but was not labeled (PAP-00445860-63).

Lead was detected in site soil at several areas investigated under ECRA in the late 1980s and early 1990s. The highest concentrations of lead in surface soil (0 to 6 inches) detected at each area were as follows: Area B [163 parts per million (ppm)], Area F (1,260 ppm), Area G (845 ppm), and Area I (1,610 ppm) (PAP-00101534, 39, 43, 48; PAS-00047149-50). In subsurface soil, maximum lead concentrations detected at each area were as follows: Area B (816 ppm), Area E (8,030 ppm), Area F (2,250 ppm), Area G (3,560 ppm), Area I (5,350 ppm) (PAP-00102025-28; PAS-00047150).

A 1992 Supplemental Project Tasks Letter estimated the volume of soil in Area E that contained residual lead above the NJDEP soil cleanup guideline of 1,000 mg/kg as being approximately 42 cubic yards. The volume of soil in Area I with residual lead above 1,000 mg/kg was estimated to be approximately 40 cubic yards. Soil in Area F was identified for excavation due to sample results for lead above 1,000 mg/kg, but the volume of contaminated soil was not specified (PAS-00048047-48, 50).

Areas E, F, and I also were stated to be impacted by lead in the 1992 Cleanup Plan. The volumes at each Area to be addressed in the 1992 Cleanup Plan were estimated as follows: Area E (21.3 cubic yards), Area F (13 cubic yards), and Area I (336 cubic yards) (PAP-00101367-69). The 1992 Cleanup Plan noted that these volumes were the amount of soil assumed to contain lead above the proposed Non-residential Surface Soil Cleanup Standard (PAP-00101434-36).

The 1994 RAR stated that the distribution of lead in the soil profile was sporadic and random. However, it also stated that the presence of elevated concentrations of lead, primarily in Area I, may be a result of the use of an incinerator formerly located on the site (PAS-00047832).

Mercury

Mercury was detected at two areas sampled during the ECRA investigation. At Area H, the former drum wash disposal pit, mercury was detected at 0.2, 1.1, and 1.5 mg/kg at depths of 5 to 6, and 7 to 8 feet below ground surface (bgs), respectively (PAP-00101543-44, 56). Samples were also collected from sediment located upstream and downstream of a suspected pipe discharge at Area H (1.3 and 0.3 mg/kg, respectively). The report stated that mercury was detected in the upstream sample and should, therefore, be considered to be occurring as background contamination (PAP-00101546, 54). The subsequent 1991 Phase II Report discussed the upstream and downstream sample locations as opposite to the upstream/downstream locations originally reported in the 1989 Soil Report (PAS-00109682).

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At Area I, the former incinerator, soil results identified mercury at concentrations up to a maximum of 8.2 mg/kg in surface sample I4 (PAP-00101548, 60).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.¹

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.² Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.³ PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.⁴

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00101552; PAP-00101548; PAP-00102025, 29).

COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	8,030 mg/kg
Copper	257 mg/kg
Mercury	8.2 mg/kg
Benzo(a)anthracene	139 mg/kg
Benzo(a)pyrene	70 mg/kg
Benzo(b)fluoranthene	109 mg/kg
Benzo(k)fluoranthene	50 mg/kg
Dibenzo(a,h)anthracene	21 mg/kg
Indeno(1,2,3-cd)pyrene	32 mg/kg

According to the 1991 Phase II Report, ambient soil was sampled to determine whether the observed constituents on site were the result of past site activities or a result of ambient conditions in the native soil/fill profile. The report states that the fill material was

¹ *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, <https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm>, Quadrangle #42 (NJDEP map identifying locations of recognized historic fill).

² *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

³ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

⁴ NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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imported and used to modify the site's topography dating back to the inception of site activities in the late 1800s (PAS-00047213). It goes on to state that the occurrence of the analytes in Areas B, E, F, and G, although at concentrations above ECRA guidelines, was considered to be within the range of expected variability based upon the range of analyte concentrations detected at background locations (PAS-00047211-12).

The 1992 Supplemental Project Tasks Letter stated that fill material had been observed at depths that vary from a minimum of approximately 3 feet in the central portion of the site to a maximum of approximately 16 feet in the vicinity of Area A. The fill was characterized by the presence of loose, poorly sorted sand, silt and clay which contained cobbles, brick, ceramics, glass, wood, and ash waste. The fill material was non-homogeneous and discontinuous across the site. In the areas adjacent to the Passaic River (Areas A and I), significant void spaces were encountered during the drilling activities (PAS-00048039).

5. COC Pathways***Sanitary Sewer***

A Trip Report Memorandum, dated February 6, 1978, stated municipal water and sanitary wastes were discharged to the municipal water system (PAP-00197571).

A subsequent Trip Report Memorandum, dated April 5, 1978, documented dye tests performed to determine the discharge point from the sewers in the building floor. No dye was observed in the Passaic River, and the report concluded that both the floor drains and sanitary effluents from the warehouse discharged into the municipal sewer system (PAS-00048054).

A municipal trunk sewer line was installed beneath Lodi Street, approximately 150 feet north of the warehouse (PAS-00048054).

Storm Sewer

A storm sewer line was noted to be on site in a Trip Report Memorandum, dated April 5, 1978. The memorandum stated that a pipe entering the river was visible during periods of low river flow; however, according to the Trip Report Memorandum, it appeared that the 16-inch diameter storm sewer drain line had been tied into the municipal system (PAS-00048054).

A Plan & Profile Showing Sewer Conduits & Pipe Lines along Lodi St., dated 1938, identified a 24-inch storm sewer that ran along Lodi Street and discharged to the Passaic River (PAP-00198147).

Direct Release

A Trip Report Memorandum, dated February 6, 1978, identified "three floor drains that discharge directly into the nearby Passaic River," but the document stated it was unknown if the drains discharged into a storm sewer or directly into the Passaic River. A

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storm drain from the parking lot was also stated to discharge to the river (PAP-00197571).

A Trip Report Memorandum, dated April 5, 1978, stated that a pipe entering the river was visible during periods of low river flow; however, it appeared that the 16-inch diameter storm sewer drain line had been tied into the municipal system. Dye testing performed during the site visit determined that the floor drains and sanitary effluents from the warehouse discharged into the municipal sewer system, as no dye was noted in the Passaic River at the proximate location of the sewer (PAS-00048054).

Facility maps from 1965 and 1969 show a 16-inch concrete sewer running across the northern end of the warehouse building and to the Passaic River (PAS-00048059-60), but this feature is not shown on other maps from 1918, 1954, 1974 and 1980. In addition, none of the maps show floor drains in the building connected to the concrete sewer or to the Passaic River as shown in the figure in Section 3 of this report (PAS-00048056-62).

According to the ECRA Sampling Plan, the interior of the warehouse had several floor drains that were believed to be connected to one conduit that ultimately discharged to the Passaic River (PAP-00197583). However, the *ECRA Sampling Plan Addendum*, dated February 1989, stated that the floor drains had been filled with cement, so access to these structures was no longer possible. In addition, the "drainage location, if any," of the conduit that may have drained to the Passaic River was unknown (PAP-00101494, 98).

According to a letter report regarding the Supplemental Project Tasks, Former Allied-Signal, Dundee Warehouse, Passaic, New Jersey, ECRA Case Number 87133, dated January 8, 1992 (Supplemental Project Tasks Letter), it was proposed to use ground penetrating radar (GPR) or other appropriate geophysical surveying techniques to locate the suspected outfall pipe to the Passaic River. A sample would be collected if the pipe was located (PAS-00048049). No records of these samples and no further information for the geophysical survey results were provided in the available file material.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

The facility was inspected by the NJDEP as part of the ECRA review process on December 8, 1988. The inspection identified several deficiencies in the proposed characterization activities that would be addressed in the Sampling Plan (PAS-00047955-58).

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There is no information regarding violations in the available file material.

Permits

A Trip Report Memorandum, dated February 6, 1978, stated the facility did not have any NJDEP or National Pollutant Discharge Elimination System (NPDES) permits (PAP-00197570). At this time, no manufacturing activities were taking place at the facility as it was being used for finished plastic storage (PAP-00197580).

7. Response Actions**Characterization Activities**

The following characterization reports have been published for the facility:

- 1989 Soil Report prepared by Environmental Resources Management, Inc. (PAP-00101521)
- *Report of Findings, Supplemental Sampling*, dated August 3, 1990 (Supplemental Sampling Report), prepared by Environmental Resources Management, Inc. (PAP-00101995).
- *Report of Findings, Determination of Ambient Site Conditions and Phase II Supplemental Sampling*, dated April 29, 1991, prepared by Environmental Resources Management, Inc. (PAS-00047158).
- 1994 RAR, submitted by AlliedSignal Engineered Materials (PAS-00109740).

Soil

In general, soil sampling in the late 1980s and early 1990s under ECRA found concentrations of lead and PAHs above the ECRA guidelines. PAHs were detected in samples collected at Area A from the base of the 1987 UST excavation, with the highest concentrations from beneath the diesel tank (PAP-00101479, 82). The 1994 RAR stated that elevated concentrations of base neutral compounds in Area B may be a result of the historical operation of the site (PAS-00047832). The highest concentrations of lead were detected in subsurface soil at Area E (8,030 ppm) (PAP-00102025-28). The 1994 RAR stated that the distribution of lead in the soil profile was sporadic and random. However, it also stated that the presence of elevated concentrations of lead, primarily in Area I, may be a result of the use of an incinerator formerly located on the site (PAS-00047832).

Copper and mercury were also detected in site soil. At Area H, the former drum wash disposal pit, mercury was detected at 1.1 and 1.5 mg/kg at depths of 5 to 6 and 7 to 8 ft bgs, respectively (PAP-00101543-44), while Area I soil results detected copper with a maximum of 257 mg/kg in surface sample I4 (PAP-00101548, 60).

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The 1989 Soil Report and 1991 Phase II Report summarized the results for sampling of 10 areas at the site. Areas where COCs were detected include the following:

- Sample Area A was characterized by the former presence of subsurface gasoline and diesel storage tanks. Soil sampling results detected maximum concentrations of PAHs at sampling location 1 Mid (depth of 18 to 24 inches) (PAP-00101532).
- Sample Area B was utilized for both tank washing and above-ground acid storage. Lead was detected at 163 mg/kg in a surface sample (0 to 6 inches depth), and PAHs were detected at maximum concentrations in soil sample B-3 (I) at 3 ft bgs (PAP-00101534-35; PAS-00047242).
- Sample Areas E and F were characterized by the presence of surficial soil staining (PAP-00101539). Concentrations of lead ranged from a minimum of 32 mg/kg in E-1 (I) (0.5 to 1 ft bgs) to a maximum of 8,030 mg/kg in E-4 (I) (0.5 to 1 ft bgs) (PAS-00047239).
- Sample Area G was the former location of a small utility shed used for the storage of small quantities of gasoline and motor oil (PAP-00101539, 42-43). Lead was detected up to a maximum concentration of 3,560 mg/kg in soil sample G-1 (I) from 3 ft bgs (PAS-00047240).
- Sample Area H contained a former drum wash disposal pit area that has been filled with cement preventing access to the pit. Mercury was detected at 1.5 mg/kg at a depth of 7 to 8 ft bgs (PAP-00101543-44). PAHs were detected at low concentrations (PAP-00101543-44). Samples were also collected upstream and downstream of a suspected pipe discharge. The report stated that mercury and lead were detected in the upstream sample and should therefore be considered as occurring as background contamination (PAP-00101546). The subsequent 1991 Phase II Report discussed the upstream and downstream sample locations as opposite to the upstream/downstream locations originally reported in the 1989 Soil Report (PAS-00109682).
- Sample Area I was the former incinerator. Soil results detected copper (maximum of 257 mg/kg; sample I4), mercury (8.2 mg/kg; sample I4), (PAP-00101548), and lead (maximum of 5,350 mg/kg; sample I-3 (I)) (PAS-00047242). PAHs were also detected at maximum concentrations in samples SB-6 (PAS-00047238).
- Sample Area J was characterized by the presence of an abandoned 1,000 gallon UST used for storage of fuel oil. PAHs were detected below the quantitation limit of the analytical procedure at 7 to 8 ft bgs (PAP-00101548-50).

Additional sampling to delineate the vertical extent of contamination was reported in the 1990 Supplemental Sampling Report. The report stated that base neutral compounds and lead exhibited a relatively ubiquitous distribution across the site. With the exception of areas A, G and I, no definable centroids of contamination were isolated. The report

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stated that nonindigenous fill material may be acting as a residual contaminant source beneath the site (PAP-00102041).

Sampling of four background soil borings from the perimeter of the site was performed in 1991 to determine the ambient soil conditions, according to the *Report of Findings Determination of Ambient Site Conditions and Phase II Supplemental Sampling*, dated April 29, 1991. Lead was detected at concentrations ranging up to a maximum of 1,120 mg/Kg in the 0 to 2 foot sample interval of BG-4 (PAS-00047195-96). Total base neutral organic compounds were detected at a maximum of 158,400 µg/kg from within the fill material. The report concluded that lead and base neutral organic compounds were detected at elevated levels in the background locations, and fill material has impacted the native soil. The report also stated, "the occurrence of the analytes in Areas B, E, F, and G, although at concentrations above ECRA guidelines, is considered to be within the range of expected variability based upon the range of analyte concentrations detected at background locations" (PAS-00047211-12).

Sediment

Samples at Area H were collected from Passaic River sediment upstream of and downstream from a suspected drain pipe. The 1989 Soil Report stated that mercury, lead, and semivolatile organic compounds were detected in the upstream sample and should therefore be considered to be as occurring as background contamination (PAP-00101546). However, it is noted that the subsequent 1991 Phase II Report discussed the upstream and downstream samples as located in opposite directions compared to the upstream/downstream locations originally reported in the 1989 Soil Report (PAS-00109682). Concentrations were as follows:

Sediment Sample Concentrations		
COC (mg/kg)	H4 (downstream)	H5 (upstream)
Lead	369	101
Mercury	1.3	0.3
Copper	101 J	32 J
Benzo(a)anthracene	1.6	2.9
Benzo(a)pyrene	1.6	2.1
Benzo(b)fluoranthene	1.5	1.8
Benzo(k)fluoranthene	1.3	1.5
Dibenzo(a,h)anthracene	0.6	1.2
Indeno(1,2,3-cd)pyrene	ND	ND

ND: Not Detected

J: estimated concentration (PAP-00101554)

Remedial Activities

NJDEP approved the 1992 Cleanup Plan in a letter dated May 4, 1993 with the following conditions. The letter stated that active remediation of lead was not required by NJDEP due to the apparent sporadic distribution of the lead across the facility. However, the asphalt pavement to be placed over the impacted areas should cover all areas of the site

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that were unpaved at that time unless soil sampling was performed to confirm the absence of contamination in exposed areas. In addition, the letter stated that the base neutral contamination detected during the August 1989 sampling event at sample locations B-1 (Area B) and I-1, I-3, and I-4 (Area I) appeared to be related to previous site operations. However, it stated that institutional controls proposed to address site-wide arsenic and lead contamination would also be adequate to address the base neutral contamination. In addition, a Declaration of Environmental Restrictions was required to ensure that the site remained industrial and that the asphalt cap was not disturbed without prior NJDEP notification and proper health and safety precautions (PAP-00101455-56).

The 1994 RAR documented how each area of concern was addressed. Areas A, B, G, and I were capped with a 3-inch stabilized base and 2-inches of asphalt. Areas E and F were capped with a permeable geomembrane and 5-inches of stone (PAS-00109757).

A Remedial Action Protectiveness/Biennial Certification Form - Soil was submitted to NJDEP on June 24, 2013, for the existing deed notice at the Dundee Warehouse property (PAP-00432471). The form included the Declaration of Environmental Conditions, dated March 1, 1994, which limited all alterations, improvements, and disturbances of the affected areas to require previous written consent from NJDEP (PAP-00432479-80). The Remedial Action Permit Application – Soil noted that the Deed Notice was for historic fill at the site (PAP-00432474).

A Soil Remediation Permit was granted to Charles Cangialosi, President of Cangialosi Family Realty LLC by NJDEP on August 28, 2013, to conduct monitoring, maintenance, and evaluation to maintain compliance and effectiveness of the remedial action and its associated institutional and engineering controls (PAP-00432521).

8. Summary of Asserted Defenses

Honeywell asserts that any releases of PAHs at the site were the result of releases of petroleum or fuel oil, which are excluded from CERCLA liability under the petroleum exclusion. See 42 U.S.C. §9601(14); see also Scope of CERCLA Petroleum Exclusion Under Sections 101(14) and 104(a)(2), Memorandum from Francis S. Blake, General Counsel to J. Winston Porter, Assistant Administrator for Solid Waste and Emergency Response, OSWER 9838.1, U.S. EPA, July 31, 1987, at 5.

ISP Chemicals LLC

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Facility Data Report**ISP CHEMICALS LLC**

Facility Name, Address and Size: ISP Van Dyk, Inc. (ISP), 11 William Street, Belleville, New Jersey (PAS-00010070); 2 parcels, 0.79 acres (chemical plant south of William Street) and 1.49 acres (2 warehouses north of William Street) (PAS-00110586); operated 24 hours/day, 7 days/week; 30 employees (20 operators, 4 shift supervisors, and 6 maintenance mechanics staffed the plant) (PAP-00094606).

1. **Business Type:** Manufacture of specialty chemicals for the personal care industry, such as sunscreens and cosmetic chemicals for both skin care and hair care (PAP-00094606).

2. **Time Period of Ownership/Operations**

Operator: 1992 to 2001

Owner: 1992 to present

1992: International Specialty Products acquired Van Dyk in 1992. ISP Van Dyk, Inc. was a wholly owned subsidiary of International Specialty Products (PAP-00094606). On March 31, 1992, ISP Van Dyk, Inc. purchased the property from Mallinckrodt, Inc. (PAP-00092134; PAS-00010177, 90). Mallinckrodt, Inc. sold the fixed and operating assets of Van Dyke & Company, including the real property at the Belleville facility, to ISP (PAS-00110293).

2001: ISP Van Dyk, Inc. ceased operations at the facility on or about March 31, 2001 (PAS-00110294). On June 27, 2001, the site was granted from ISP Van Dyk, Inc. to ISP Chemicals LLC (PAS-00010180), and on June 29, 2001, ISP Van Dyk, Inc. merged into ISP Chemicals Inc. (PAS-00010189). ISP Chemicals, Inc. is the corporate successor to ISP Van Dyk, Inc. (PAS-00110294).

2010: The buildings on the parcel south of William Street were demolished from June 2010 to March 2011. The parcel to the north of William Street was predominantly utilized for warehouse space and employee parking, and continues to be used for document storage by ISP (PAP-00093884).

3. **Operational History/COC Use and Presence at the Facility**

According to the *Preliminary Assessment for the ISP Chemicals Inc. Facility*, dated April 12, 2002 (2002 Preliminary Assessment), ISP produced and manufactured personal care and cosmetic ingredients (PAP-00092159). A letter from ISP to EPA, dated June 17, 2005, stated that the cosmetic products included a main component in sunscreens (ultraviolet absorbers), emulsifiers, and emollients (PAS-00110586).

A Description of Process and Manufacturing Activities Since Acquisition in 1992 (Description of Activities) was prepared by the production supervisor for ISP Van Dyk and dated December 3, 2001. The 2001 Description of Activities stated that the facility separated its product lines by building. Buildings 3, 4, and 4A were primarily dedicated to the manufacture of sunscreen products, which involved creating the ester or "crude" in glass-lined carbon steel reactors. The sunscreens then would undergo a purifying step

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by distillation in stainless steel batch distillation units. In addition, cosmetic products requiring solvents, strong acid catalyst, or activated carbon treatment and filtration were produced in Building 4. All other cosmetic products were manufactured in Building 7. The cosmetic product line primarily manufactured in stainless steel reactors were fatty acid-based esters that were either packaged as a liquid or flaked prior to packaging. The plant had two "hot rooms" for re-mobilizing solidified material charged as a liquid (PAP-00094609).

The 2001 Description of Activities also provided a list of each of ISP's products and associated raw materials and manufacturing processes. No chemicals of concern (COCs) were identified on this list (PAP-00094616-75). In addition, a list of chemicals handled at the facility was compiled by ISP in 1995, but did not include any COCs (PAP-00094082).

A list of chemicals that have been used at the property was compiled in the 2002 Preliminary Assessment using Material Safety Data Sheets available from historical operations at the facility. The table included copper chloride 99.995%, copper iodide 99.999%, copper cyanide 99%, mercury, and polychlorinated biphenyls (PCBs) (PAP-00092198, 201-202). However, the document does not specify to what timeframe this list of chemicals used at the facility corresponds. It is noted that the 2002 Preliminary Assessment also stated that ISP never used any substances containing PCBs or mercury (PAP-00092160).

4. Identified COCs

- PCBs (detected)
- PAHs (used, detected)
- Copper (used)
- Lead (detected)
- Mercury (detected)

PCBs

The 2002 Preliminary Assessment stated that ISP never used any substances or chemicals containing PCBs (PAP-00092160). In addition, according to an undated list titled Soil Delineation Status and provided as part of the "Changes Made by ISP (1992 to 2001)" document, ISP did not use nor manufacture PCBs (PAS-00110305). The 2002 Preliminary Assessment stated that PCB contamination of various areas within the facility occurred as a result of the PCB-containing heating oil leaking from valves or other fixtures in the oil lines of the hot oil heating system operated by Van Dyk, Inc. prior to 1979 (PAP-00092136). According to a letter from ISP to EPA, dated June 17, 2005, process oil containing PCBs was utilized from 1965 to 1979 as part of the manufacturing process to heat reaction vessels in Building 7 and distillation columns in Building 4. On July 16, 1979, the entire oil system was drained and cleaned to remove PCB contaminated oil in accordance with requirements set forth by the Toxic Substances Control Act (TSCA) (PAS-00110586).

A list of chemicals that have been used at the property was compiled in the 2002 Preliminary Assessment using Material Safety Data Sheets available from historical operations at the facility. The table included PCBs (PAP-00092202). However, the document does not specify to what timeframe this list of chemicals used at the facility corresponds.

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As discussed in the 2002 Preliminary Assessment, PCBs were detected on site soil and remedial excavations were performed by the previous owner, Avon Products, Inc. (Avon). The document stated that Avon was the responsible party (PAP-00092138-40, 61, 80). According to a letter from ISP to EPA, dated June 17, 2005, Avon hired IT Corp. to delineate PCB contamination at the site, which was completed in 1995 (PAS-00110585-86). Maximum concentrations of PCBs in soil samples at identified areas of concern (AOCs) as presented in the *Remedial Investigation Report*, dated August 15, 2006 (2006 RI Report) and the *Remedial Investigation/Remedial Action Progress Report*, dated October 27, 2011 (RI/RA Progress Report) are as follows (see Section 7 for a description of each AOC):

Maximum PCB Concentrations in Soil at Each AOC			
AOC	PCBs (mg/kg)	Sample ID	Depth (ft bgs)*
AOC 1 [Fuel Oil Underground Storage Tanks (USTs)]	4.63	A1-SS-7A	4.5-5
AOC 4 (Alleyway)	15,800	A27-13A**	1-1.5
AOC 5 (Drum Storage Areas)	0.972	A5B-1B	4.5-5
AOC 7 (Beneath Boiler Room)	10,000	B-15	7-9
AOC 11 (Building No.4 Vent Staining)	4.88	A11-SS-1A	0-0.5
AOC 13 (Building No.7 Hot Room)	0.3254	A27-51C	1.5-2.0
AOC 14 (Historic Filling Station)	0.764	A14-SS-1	4.5-5
AOC 16A (Building No.1 Subsurface Conditions)	2.3	A16A-4A	0-0.5
AOCs 6, 21, 22, 23, 24, 25, and 26 (Floor Staining, Cracks and Deterioration)	336	SB-4B	1-1.5
AOC 27 (Manufacturing Facility Drainage)	15,800	A27-13A**	1-1.5

(PAP-00092622, 24, 26, 28, 32, 34, 65, 71, 72, 74; PAP-00093930)

ft bgs: feet below ground surface

mg/kg: milligrams/kilogram

* The soil boring logs in Appendix F of the 2006 RI Report show that most of the referenced sample locations in this table were covered with 5 to 8 inches of concrete. Only the boring A11-SS-1 at AOC 11 was not installed through concrete (PAP-00092377, 399, 430, 434, 441, 447, 470, 510). The sample at AOC 7 was collected from beneath Building 2 (PAP-00093930).

** Note this appears to be the same sample reported in the 2006 RI Report for both AOCs.

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Facility Data Report**PAHs**

Fuel oil underground storage tanks (USTs) were used at the facility as identified in the 2002 Preliminary Assessment:

- Two 25,000-gallon fuel oil USTs were located in the alleyway between Buildings No. 1 and No. 4. The southern tank was reported to have leaked and been abandoned in place by previous site owner Avon in 1993. The northern tank was abandoned in place by ISP on January 16, 1999. The tank was reportedly in good condition with no visibly-observable holes or cracks (PAP-00092137).
- A former 1,000-gallon No. 2 fuel oil UST was located adjacent to the southwestern corner of the facility warehouse building adjacent to William Street. This UST was abandoned in place by ISP on February 23, 1999. The tank was reportedly in good condition with no visibly observable rust holes (PAP-00092141).
- A former 550-gallon No. 2 fuel oil UST was located adjacent to the west side of the warehouse. On September 30, 1998 this 550-gallon UST was excavated and removed (PAP-00092142).

Based on a review of the 2006 RI Report data tables, PAHs were detected at several AOCs. A map depicting the AOC locations is provided in Section 7. Maximum concentrations were detected at the following AOCs:

Maximum PAH Concentrations (in mg/kg) in Soil			
AOC	4	6	27
Sample	B-30A (1-1.5 ft bgs)	SB-11A (0.5-1 ft bgs)	A27-9A (2-2.5 ft bgs)
benzo(a)anthracene	0.944	2.05	8.05
benzo(a)pyrene	1.98	1.51	7.64
benzo(b)fluoranthene	2.14	1.32	5.80
benzo(g,h,i)perylene	1.41	0.880	4.62
benzo(k)fluoranthene	1.55	1.06	5.56
chrysene	6.01	2.85	8.58
dibenzo(a,h)anthracene	0.248 J	0.307	1.58
fluoranthene	0.595	5.71	16.9
indeno(1,2,3-cd)pyrene	0.943	0.914	4.39
pyrene	2.50	5.74	17.7
Source	(PAP-00092651-52)	(PAP-00092681-82)	(PAP-00092687-88)

J: estimated concentration

The *Soils Remedial Action Workplan*, dated October 2008 (Soils RAWP) attributed the detections of PAHs in site soil to the presence of fill material used during construction and grading of the facility (PAP-00099895, 912).

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Facility Data Report***Copper***

The 2002 Preliminary Assessment identified copper chloride 99.995%, copper iodide 99.999%, copper cyanide 99% as being used at the site based on Material Safety Data Sheets available from historical operations at the facility (PAP-00092198). The 2002 Preliminary Assessment did not specify the timeframe that copper was used at the facility, and available records did not provide information regarding the use of copper at the facility. No sampling data for copper were identified in the available file material.

Lead

According to the 2006 RI Report, lead was detected at one AOC (AOC 14, Historic Filling Station), at a maximum concentration of 299 mg/kg and a depth of 5.5-6.0 feet below ground surface (ft bgs). Only subsurface soil was sampled in this area. However, the RI Report stated that this AOC was identified based on 1951 and 1961 Sanborn maps, which depicted a filling station with two USTs. A chain of title search stated that Tulsa Oil Company owned a portion of the property north of William Street from 1947 to 1976 (PAP-00092601, 30, 72).

Mercury

The 2002 Preliminary Assessment stated that ISP never used any substances or chemicals containing mercury (PAP-00092160). In addition, according to an undated list titled Soil Delineation Status, ISP did not use nor manufacture mercury (PAS-00110305). According to the 2011 RI/RA Progress Report, the Napier Hat Company historically may have used site buildings or portions of the site for their operations in the early 1900s. Since the hat manufacturing process involved the use of mercury salts, the document stated that those operations are believed to be the source for low levels of mercury found in some soil samples on the site (PAP-00093883).

A list of chemicals that have been used at the property was compiled in the 2002 Preliminary Assessment using Material Safety Data Sheets available from historical operations at the facility. The table included mercury (PAP-00092201). However, the document does not specify to what timeframe this list of chemicals used at the facility corresponds. Mercury was detected at several AOCs as identified in the 2006 RI Report:

Maximum Mercury Concentrations in Soil at Each AOC			
AOC	Mercury (mg/kg)	Sample	Depth (ft bgs)*
AOC 1 (Fuel Oil USTs)	3.2	A1-SS-8B	10-10.5
AOC 4 (Alleyway)	11.7	A27-13A	1-1.5
AOC 5 (Drum Storage Areas)	14.8	A5B-4A	0-0.5
AOC 7 (Beneath Boiler Room)	1.9	B-3B	9.5-10.0
AOC 11 (Building No.4 Vent Staining)	4.6	A11-SS-1A	0-0.5

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Maximum Mercury Concentrations in Soil at Each AOC			
AOC	Mercury (mg/kg)	Sample	Depth (ft bgs)*
AOC 12 (Building No.3 Storage Room Floor/Wall Gap)	1.5	A12-SS-1A	0-0.5
AOC 13 (Building No.7 Hot Room)	0.19	A27-51A	0-0.5
AOC 16A (Building No.1 Subsurface Conditions)	16.4	A16A-2A	0-0.5
AOCs 6, 21, 22, 23, 24, 25, and 26 (Floor Staining, Cracks and Deterioration)	180	SB-4A	0-0.5
AOC 27 (Manufacturing Facility Drainage)	84	A27-23A	0.5-1

(PAP-00092626, 30-32, 35, 50, 58, 64-65, 67, 69, 71)

* The soil boring logs in Appendix F of the 2006 RI Report show that most of the referenced sample locations in this table were covered with 4 to 21 inches of concrete. Only the boring A11-SS-1 at AOC 11 and A27-51 at AOC 13 were installed at the surface without first drilling through concrete (PAP-00092378, 402, 404, 430, 432, 439, 447, 470, 509).

According to an undated list titled Soil Delineation Status and provided as part of the "Changes Made by ISP (1992 to 2001)" document, mercury was present in samples of floor sweepings up to a maximum concentration of 19 parts per million (ppm), and mercury was present in concrete flooring to a maximum level of 4.5 ppm (PAS-00110304).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.¹

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.² Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.³ PAHs, lead,

¹ *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, <https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm>, Quadrangle #41 (NJDEP map identifying locations of recognized historic fill).

² *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

³ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current

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copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.⁴

The levels of PAHs, lead and mercury detected at the site in soils are presented in the table below (PAP-00092632, 72, 87-88).

COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	299 mg/kg
Mercury	180 mg/kg
Benzo(a)anthracene	8.05 mg/kg
Benzo(a)pyrene	7.64 mg/kg
Benzo(b)fluoranthene	5.80 mg/kg
Benzo(k)fluoranthene	5.56 mg/kg
Dibenzo(a,h)anthracene	1.58 mg/kg
Indeno(1,2,3-cd)pyrene	4.39 mg/kg

The 2008 Soils RAWP attributed the detections of PAHs in site soil to the presence of fill material used during construction and grading of the facility (PAP-00099895, 912).

5. COC Pathways

Sanitary Sewer

The 2001 Description of Activities stated that contact process wastewater was treated separately for both manufacturing buildings. Contact process wastewater generated in Building 7 was treated for pH if necessary in an available reactor prior to discharge. Wastewater generated in Buildings 3, 4, and 4A was treated by a neutralization system for pH prior to discharge into the sewer. The neutralization system in Building 4A was installed in 1995. In October 1997, an open trench drainage system in Buildings 4 and 4A was removed and collection sumps were installed throughout the buildings. The floors were pitched toward the sumps for proper drainage. Level switches triggered pumps which transferred the collected water to the overhead piping to the wastewater connection to the Passaic Valley Sewerage Commission (PVSC) (PAP-00094608-10).

In October 1999, the wastewater outfall system was modified to include additional monitoring equipment, interlocks, piping changes and a tank installation. All water leaving the plants and labs was monitored continuously for lower explosive limit (LEL) and pH (PAP-00094608-10). According to the 2002 Preliminary Assessment, process water from Buildings 3, 4, and 7 was pumped into a wastewater tank prior to discharging to the PVSC (PAP-00092166).

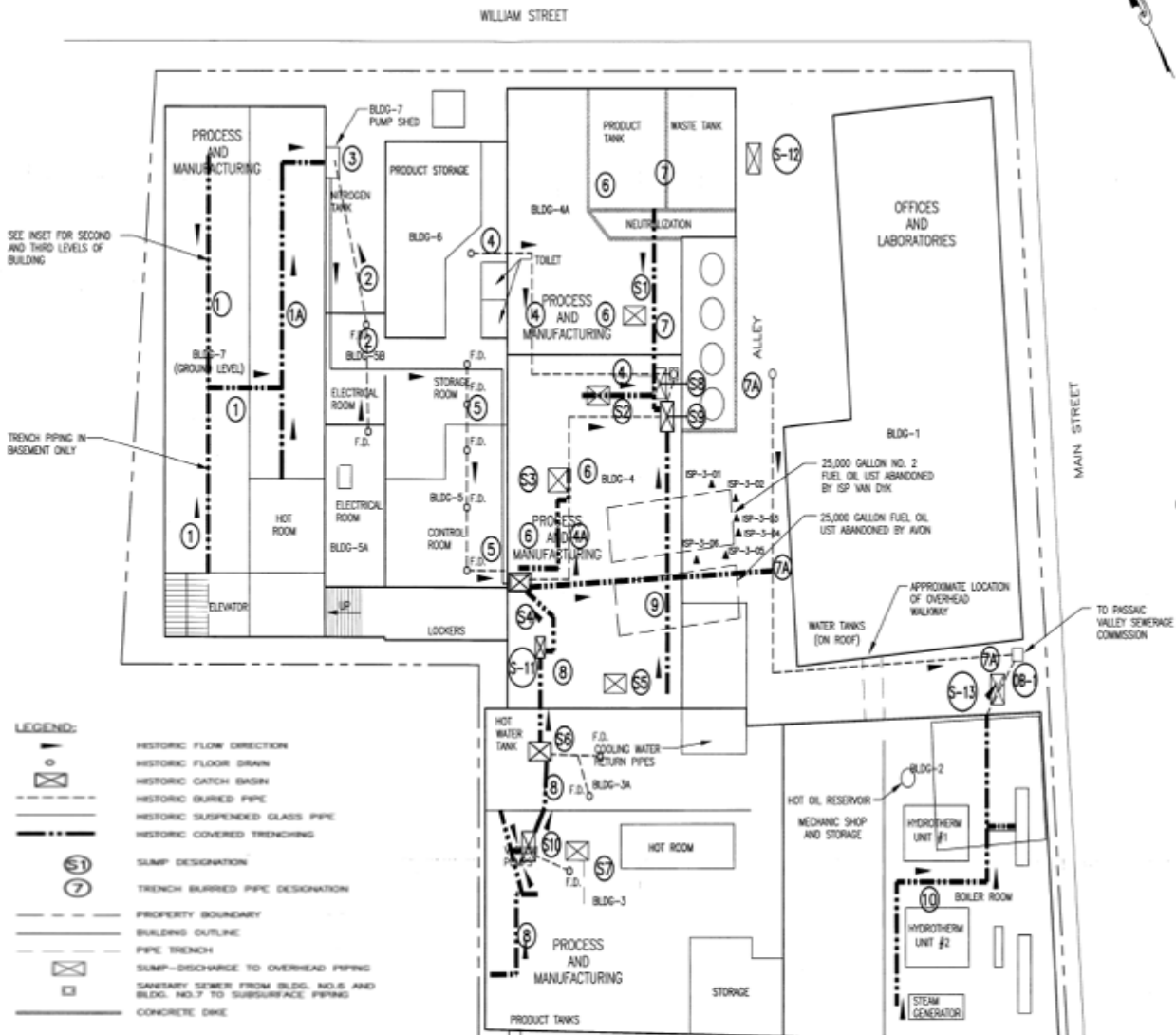
version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

⁴ NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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A map of the historical floor drains, catch basins, and trenches was provided in a letter to NJDEP dated February 25, 2005 (see below). This figure also shows that the site connects to the PVSC sewer under Main Street (PAP-00098699). ISP has submitted specific documentation that the company asserts confirms that there is no combined sewer overflow (CSO) in the vicinity of the Belleville Site. The Allocation Team will take this information into account in its review of relevant sewer systems (PAP-00095359)"

**Direct Release**

There is no information regarding direct releases in the available file material.

Spills

There is no information regarding COC spills in the available file material.

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Facility Data Report**6. Regulatory History/Enforcement Actions*****Inspections***

According to the 2002 Preliminary Assessment, the property was inspected by a representative of the NJDEP on June 14, 2001. The NJDEP inspector noted several areas of stained floors, paving, and walls during the site inspection. The NJDEP inspector required that ISP identify each area, provide its location, identify the substances that were discharged to these areas, and determine whether the discharge had impacted the soil and/or groundwater beneath the subject property (PAP-00092135-36). It is unclear if COCs were associated with these areas.

Violations

As discussed in the 2002 Preliminary Assessment, the PVSC did not note any violations associated with COCs as of January 2, 2002 (PAP-00092176).

Permits

According to a 1999 Superior Court case between the PVSC and ISP (Docket No. C-210-99), the PVSC issued Sewer Connection Permit No. 01407090, with an effective date of July 14, 1997 and an expiration date of July 13, 2002 (PAP-00095324). The permit was not identified in the available records.

7. Response Actions***Characterization Activities***

The following characterization activities have taken place at the facility:

- 2002 Preliminary Assessment, prepared by URS Corporation (PAP-00092119). *Baseline Ecological Evaluation for the ISP Chemicals Inc. Facility*, dated August 15, 2006, prepared by URS Corporation (PAP-00092964).
- 2006 RI Report prepared by URS Corporation (PAP-00092577).
- 2008 Soils RAWP, prepared by Geosyntec Consultants (PAP-00099868).
- 2011 RI/RA Progress Report, prepared by Geosyntec Consultants (PAP-00093871).

Soil

The 2002 Preliminary Assessment identified 14 AOCs at the site (PAP-00092136-37). Note that several of the AOCs were not attributed to ISP, and previous owner Avon Products, Inc. was identified as the responsible party. The 14 AOCs were as follows:

- AOC 1: Two 25,000-gallon Fuel Oil USTs Located in the Alleyway Between Buildings No. 1 and No. 4. The southern tank was stated to have leaked and been abandoned in place by previous site owner, Avon Products, Inc., in 1993. The northern tank was abandoned in place by ISP on January 16, 1999. The

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tank was reportedly in good condition with no visibly-observable holes or cracks (PAP-00092137).

- AOC 2: Suspected 1,000-Gallon No. 2 Fuel Oil. This UST was determined not to exist (PAP-00092138).
- AOC 3: Exterior Stained Soil Areas Located at the Rear Portions of the Main Manufacturing Building. PCBs were detected at 1.9 ppm in soil, but Avon Products, Inc. was identified as the responsible party and excavated the soil (PAP-00092138-39).
- AOC 4: Main Manufacturing Building Alleyway Soil Contamination. Soil was collected from beneath the main manufacturing building alleyway in 1986. The PCB concentration at 0 to 2.0 ft bgs was 1,300 ppm and the PCB concentration at 6.0 to 8.0 ft bgs was 3.0 ppm (PAP-00092139).
- AOC 5: Drum Storage Areas. Raw and finished materials were stored in the covered outdoor storage area and hazardous waste for disposal was stored in the open outdoor storage area. The 2002 Preliminary Assessment stated there have been no reported spills in the area, the area is paved with asphalt, and no staining or other evidence of a release was observed during a site inspection (PAP-00092139-40).
- AOC 6: PCB Contaminated Building Interior Surfaces. PCBs were detected in chip samples collected from the ceilings, walls, and floors of the buildings in 1986 (PAP-00092140).
- AOC 7: PCB Soil Contamination Located Beneath the Boiler Room Floor. Soil sampling conducted beneath the floor of the boiler room revealed that PCB soil contamination was present at concentrations up to 10,000 ppm. Avon Products, Inc. was identified as the responsible party (PAP-00092140). As stated in the 1994 RI Report prepared by IT Corporation: "There were eight soil borings of the 20 which were advanced along the boiler room/property line perimeter, four each on the eastern and southern property lines... Analytical results of the PCB analysis of these soil samples state there is no surficial or deep PCB soil contamination extending beyond the facility boiler room/property." Total PCB concentrations collected at either one to three feet (four samples along eastern property line; paved surface) or zero to two feet (four samples along southern property line; unpaved surface) below grade, ranged from 0.018 mg/kg to 0.49 mg/kg. Total PCB concentrations in deeper soil samples ranged from not detected to 16 mg/kg (PAP-00101162).
- AOC 8: Former 1,000-Gallon No. 2 Fuel Oil UST. The former 1,000-gallon No. 2 fuel oil UST was located adjacent to the southwestern corner of the facility warehouse building adjacent to William Street. This UST was abandoned in place by ISP on February 23, 1999. The tank was reportedly in good condition with no visibly observable rust holes (PAP-00092141).

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- AOC 9: Former 550-Gallon No. 2 Fuel Oil UST. This UST was located adjacent to the west side of the warehouse north of AOC 8. On September 30, 1998, this 550-gallon UST was excavated and removed (PAP-00092142).
- AOC 10: Groundwater Monitoring Well No. 2 (MW-2). A Classification Exception Area (CEA) was established for groundwater based on the presence of PCBs in samples collected from monitoring well MW-2. The NJDEP approved the CEA in a letter dated December 18, 1996 (PAP-00092142).
- AOC 11: Building No. 4 Vent Staining. Black staining from a vent pipe on the roof of Building No. 4 was observed on the roof, the side of the building, and on the landscape stone area below during an initial site inspection (PAP-00092185).
- AOC 12: Building No. 3 Storage Room Floor/wall Gap. An open trench between the wall and floor approximately four inches wide was observed at the eastern side of the room near Tank No. 455, and a one-inch gap between the wall and floor was observed at the southern side of the room. The trench was concrete-lined, but a small crack (approximately 0.1 inch in width) was observed between the wall and the bottom of the south trench. An oily absorbent boom was observed in the trench and the floor and walls appeared to be oil stained (PAP-00092186).
- AOC 13: Building No. 7 Hot Room. A small area of deteriorated concrete with exposed soil below was noted in the hot room floor (PAP-00092186).
- AOC 14: Historic Filling Station. The portion of the property located to the north of William Street and at the northwest corner of the intersection of William and Main Streets was noted to be a filling station with two underground storage tanks in 1951 and 1961 Sanborn maps (PAP-00092186-87).

The AOCs relevant to ISP operations included the fuel oil USTs (AOC 1, 8, and 9), drum storage areas (AOC 5), staining on the facility buildings (AOCs 11 and 12), and deteriorated concrete (AOC 13) (PAP-00092137, 39-40, 42, 85-86).

Additional AOCs were identified in the 2006 RI Report:

- AOC 15: 1993 Toluene Spill
- AOC 16/16A: Building No. 1 Elevator Hydraulic Fluid and Subsurface Conditions. A sample of oil from the elevator drip pan in Building No. 1 was reported in 1987 to have had a PCB concentration of 56 ppm, possibly from the elevator hydraulic oil itself.
- AOC 17: Staining Present on Floors and Walls in Building No. 2.
- AOC 18: Building No. 3 Hot Room. Heavy staining was noted to be present in four troughs.

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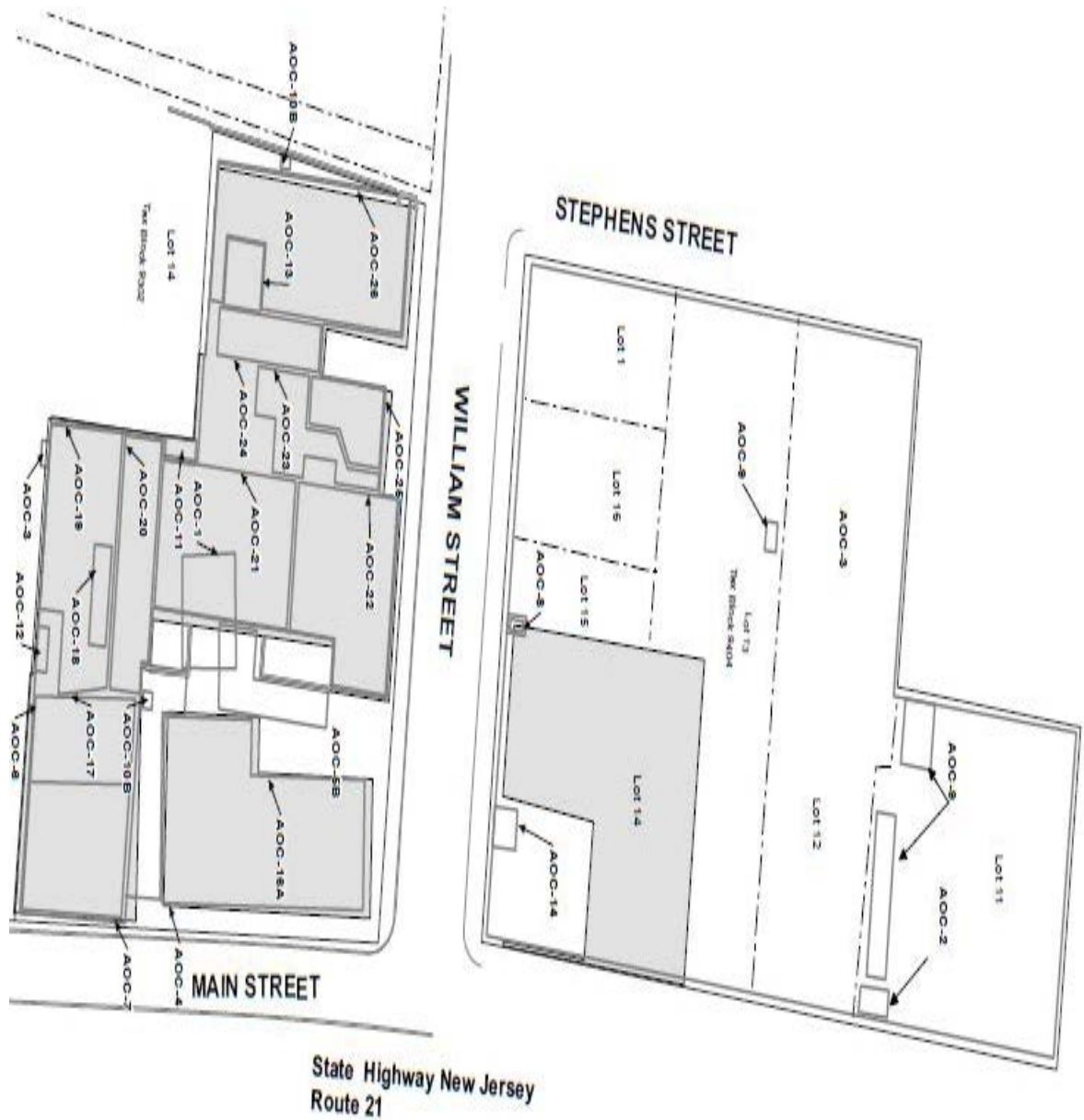
- AOC 19: Open AST Area in Building No. 3. Thick oily sludge was noted to be present on the floor.
- AOC 20: Building No. 3A. Heavy staining was noted to be present on all surfaces. In addition, a floor drain exists near the hot water tank.
- AOC 21: Building No. 4. Heavy staining was noted to be present on the floor.
- AOC 22: Building 4A. Heavy staining was noted to be present on the floor.
- AOC 23: Staining Observed in The Hallway Between Building No.4 and Building No.7
- AOC 24: Building No. 5A and Building No. 5b: Heavy staining was noted to be present on the floor.
- AOC 25: Building No.6 AST Area. Heavy staining was noted to be present on the floor.
- AOC 26: Stained Surfaces in Building No. 7
- AOC 27: Manufacturing Facility Drainage (PAP-00092602-06)

Finally, AOCs 31, 32, and 33 were identified in the 2011 RI/RA Progress Report as follows (AOCs Nos. 29 and 30 were not used in the numbering scheme):

- AOC 31: Subject Property Located North of William Street
- AOC 32: Vapor Intrusion
- AOC 33: Baseline Ecological Evaluation (PAP-00093914)

The AOCs are identified on the following figure from the 2011 RI/RA Progress Report (PAP-00093923):

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PCBs, mercury, and PAHs were detected in soil at several AOCs. The 2008 Soils RAWP identified soils with PCB concentrations up to 15,800 mg/kg as being present at the site. The Soils RAWP stated that leaks and spills associated with a "Therminol" hot oil heating system used from 1965-1976 and a "significant release" from the north Hydrotherm boiler in the early 1970s were believed to be the source of the PCB-impacted soils below certain sections of the site. Mercury was detected at concentrations up to 180 mg/kg, and the mercury-impacted soils were attributed to a previous owner's hat manufacturing process that used mercury salts. In addition, this document attributed the concentrations of PAHs in site soil to the presence of fill material used during construction and grading of the facility (PAP-00099875, 881-2, 895, 912).

Remedial Activities

According to a letter from ISP to EPA, dated June 17, 2005, the NJDEP Environmental Cleanup Responsibility Act (ECRA) was initially triggered when Mallinckrodt Inc. obtained the property from Avon Capitol Corporation on May 3, 1986. Avon Capitol Corporation hired IT Corp. to delineate PCB contamination at the site, which was completed in 1995. On April 7, 1992, the NJDEP Industrial Site Recovery Act (ISRA) was triggered when ISP purchased the site from Mallinckrodt Inc. When ISP operations ceased in April 2001, ISRA was triggered for a third time. ISP entered into a remediation agreement with the NJDEP to combine the three ECRA/ISRA cases, to allow ISP to complete all of the Responsible Party ISRA obligations, and to comply with the TSCA PCB rules (PAS-00110585-86). The Remediation Agreement was signed by ISP on January 8, 2002 (PAS-00110301).

As documented in the 2008 Soils RAWP and 2011 RI/RA Progress Report, six AOCs have received no further action (NFA) approval from NJDEP (i.e., AOCs 2, 3, 5A, 8, 9, 15, and 31), eight were approved for no further investigation (i.e., AOCs 5A, 12, 18, 20, 23, 24, 25, 26) and five AOCs were not related to soil contamination or were due to an error in numbering (i.e., AOCs 10A, 10B, 28, 29, 30, 32) (PAP-00093886-90; PAP-00099889-90).

The 2008 Soils RAWP proposed to excavate all contaminated soils with PCB concentrations in excess of 100 mg/kg and implement engineering (i.e., a cap of at least 6 inches thick extending over the entire) and institutional controls (i.e., deed notice) to limit access and exposure to the contaminants remaining at the site (PAP-00099876-77).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

Kearny Smelting

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KEARNY SMELTING AND REFINING CORP

Facility Name, Address and Size: Kearny Smelting and Refining Corp. (KSRC), 936 Harrison Ave., Kearny, NJ, 11.8 acres (PAP-00190121). The site is bounded to the north by the Erie-Lackawanna Railroad (originally the Newark and Hudson Railroad), to the east by the Delaware - Lackawanna and Western Railroad, to the south by Harrison Avenue and two industrial properties, and to the west by residential and industrial properties (PAP-00217329). According to the "Current Site Map" created by JMZ Geology, the site includes Block 275 Lots 1B and 2A and Block 276 Lots 1B, 1C, and 3 (PAP-00004657). See Site Map below.

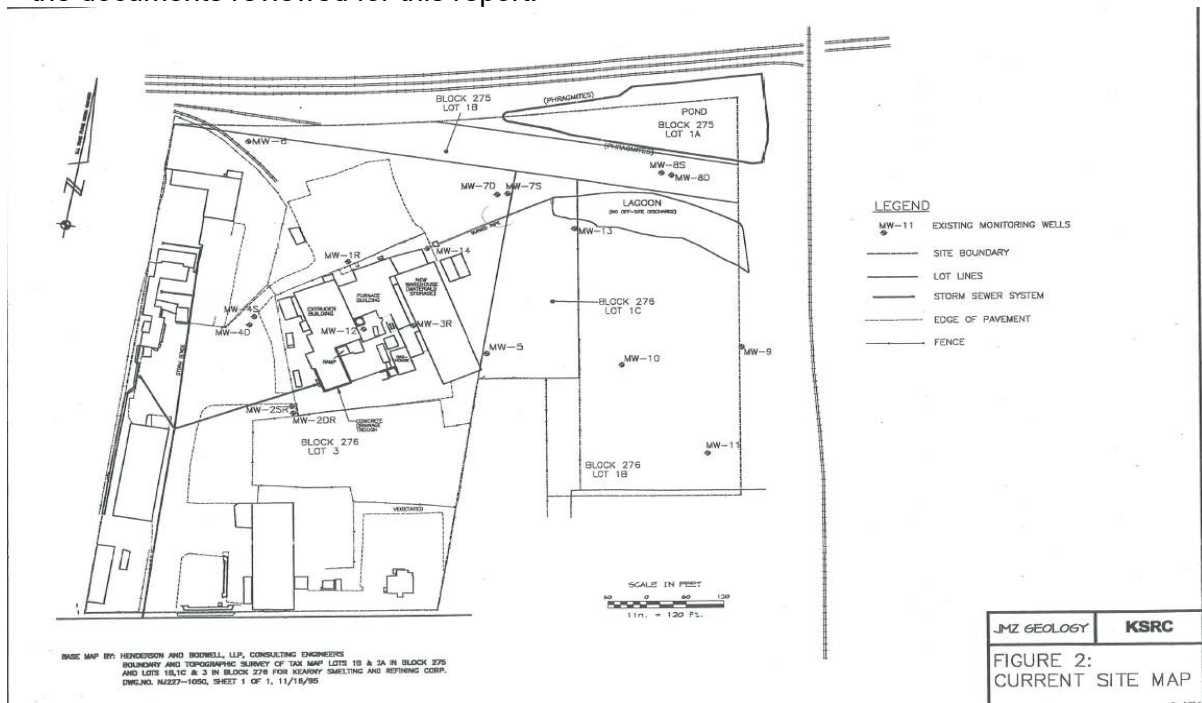
The *Revised Phase II Remedial Investigation Workplan*, dated August 1996 (1996 Rev. Phase II RIWP) provided the following owners of the site:

Property	Acreage	Owner
Block 276 Lot 3	9.61	KRSC
Block 276 Lot 1C	0.594	Michel G Rothschild
Block 275 Lot 1B	0.893	M. Rothschild
Block 275 Lot 2A	0.675	M. Rothschild
Total acreage	11.772	

(PAS-00032551)

Note: Property conveyances were not available in the documents reviewed for this report to verify the ownership and acreage provided in the above table.

Information regarding the number of employees and hours worked was not available in the documents reviewed for this report.



(PAP-00004657)

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1. **Business Type:** Casting and extrusion of brass and bronze

2. **Time Period of Ownership/Operations**

Operator: 1944 to Present

Owner: 1944 to Present

(PAP-00190066)

The 1996 Rev. Phase II RIWP listed the following businesses operating on the site:

<u>Business</u>	<u>Nature of Operations</u>
Kearny Smelting	casting and extrusion of brass and bronze
D R Tweed	repair and service of lift trucks
Mac Metals Inc	sales/showroom for architectural metals
West Hudson Auto Body	auto body repair
Athens Diner	restaurant
Delbros Inc	sanitation truck storage
M&G Tool and Die Co	machine shop

(PAS-00032551)

Note: The location of the businesses operating on the site was not provided in the 1996 Rev. Phase II RIWP and no other documents were available to review for verification.

3. **Operational History/COC Use and Presence at the Facility**

KSRC operated a non-ferrous metals manufacturing facility from approximately 1945 until 1975. During the smelting process, KSRC melted approximately 50,000 to 60,000 pounds of scrap metal per day containing copper, tin and/or zinc alloys in a rotary smelting furnace. This process resulted in discharges to a lagoon at the facility (PAS-00003777-78).

A 1986 US EPA Potential Hazardous Waste Site Preliminary Assessment states that substances present at the Kearny Smelting facility included zinc oxide, copper, tin, lead, iron, nickel, and zinc, and that NJDEP alleged that wastewater originating onsite has been discharged to the ground and surface waters (PAP-00004622-24).

According to the 2018 Phase I Environmental Site Assessment, dated April 13, 2018 (2018 Phase I ESA), the site consists "of a 16 acre parcel of land improved with three buildings that are occupied by Kearny Smelting & Refining, two buildings occupied by Mac Metals and three vacant buildings being prepared for demolition. The majority of the existing structures on the site were constructed in the 1940's with the addition of the KSR inventory storage warehouse which was constructed in 2006. KSR's operations include manufacturing custom bronze, brass and nickel silver profiles, sections and extrusions. Mac Metals operations include sales/showroom of architectural metals for KSR. The three vacant buildings are unrelated to KSR's operations" (PAP-00431830).

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According to the 2018 Phase I ESA, the following hazardous substances and petroleum products were observed during the site inspection:

Summary			
Material	Quantity	Use	Comments
Various Cleaners and Lubricants	Small quantities in plastic bottles and metal spray cans	General Maintenance of industrial operations equipment	Various cleaners and lubricants were observed throughout the Site. All of the materials observed appeared to be properly labeled and stored with no significant evidence of leaks or spills apparent. These materials do not comprise a REC to the Site.
Used Hydraulic Oil	55-gallon drums	Maintenance of industrial operations equipment	The material was observed to be stored inside drums (see subsequent section) and properly labeled.
Hydraulic Oil	55-gallon drums	Maintenance of industrial operations equipment	The material was observed to be stored inside drums (see subsequent section) and properly labeled.
Waste Oil	55-gallon drums	General Maintenance of warehouse equipment	Waste oil is temporarily collected in a series of portable waste oil cans. Waste oil is then transferred to waste oil 55-gallon drums present on the Site (see subsequent sections). Waste oil is reportedly periodically collected by a licensed waste hauler.
Motor Oil	Small quantities in plastic bottles	General Maintenance of warehouse equipment	Various motor oil was observed throughout the Site. All of the materials observed appeared to be properly labeled and stored with no significant evidence of leaks or spills apparent. These materials do not comprise a REC to the Site.
Diesel Fuel	55-gallon drums	Warehouse equipment	The material was observed to be stored inside a drum (see subsequent section) and properly labeled.

(PAP-00431881)

4. Identified COCs

- PCBs (detected)
- PAHs (used, detected)
- Copper (used, detected)
- Lead (used, detected)
- Mercury (detected)

PCBs

The *Phase II Remedial Investigation Workplan*, dated October 1995 (1995 RIWP) states that based on previous investigations, onsite soils have been determined to be adversely impacted by PCBs through both current and historical facility processes and the historical filling of the site (PAP-00190077).

According to the 1996 Rev. Phase II RIWP, the following results for PCBs were reported above the NJDEP Non-residential Direct Contact Soil Cleanup Criteria from the March 1993 soil sampling event:

March 1993 PCB Soil Sampling			
COC	Sample No.	Depth [below ground surface (bgs)]	Result (parts per million (ppm))
Aroclor 1254	MW1S	8.5 to 9 feet	14.0
Aroclor 1254	SB 1B	0 to 0.5 feet	11.0
Aroclor 1248	SB 12	0 to 0.5 feet	7.2

(PAS-00032615, 17)

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PAHs

The 1995 RIWP states that based on previous investigations, onsite soils have been determined to be adversely impacted by metals and PAHs through both current and historical facility processes and the historical filling of the site (PAP-00190077).

According to the 1996 Rev. Phase II RIWP, the following results for PAHs were reported above the NJDEP Non-residential Direct Contact Soil Cleanup Criteria from the March 1993 soil sampling event:

Benzo(a)anthracene NJDEP Non-residential Direct Contact Soil Cleanup Criteria = 4.0 ppm		
Sample No.	Depth (bgs)	Results (ppm)
SB 10	0 to 0.5 feet	8.6
MW4S	10 to 10.5 feet	4.6
MW7SA	0 to 0.5 feet	3.9

(PAS-00032616, 18, 19)

Benzo(a)pyrene NJDEP Non-residential Direct Contact Soil Cleanup Criteria = 0.66 ppm		
Sample No.	Depth (bgs)	Results (ppm)
SB 1A	0 to 0.5 feet	2.4
SB 1B	0 to 0.5 feet	3.4
SB 3	0 to 0.5 feet	1.0
SB 5A	0 to 0.5 feet	0.750
SB 7A	0 to 0.5 feet	0.820
SB 8	0 to 0.5 feet	1.2
SB 10	0 to 0.5 feet	7.2
SB 12	0 to 0.5 feet	1.5
SB 13	0 to 0.5 feet	1.8
SB 16	10.5 to 11 feet	0.670
MW2S	8 to 8.5 feet	2.0
MW3S	0 to 0.5 feet	0.860
MW4S	10 to 10.5 feet	3.3
Sample No.	Depth (bgs)	Results (ppm)
MW5S	10 to 10.5 feet	1.3
MW7SA	0 to 0.5 feet	3.9
MW7SB	0 to 0.5 feet	1.1
MW7D	0 to 0.5 feet	2.7

(PAS-00032615-19)

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Benzo(b)fluoranthene NJDEP Non-residential Direct Contact Soil Cleanup Criteria = Not Established (NE)		
Sample No.	Depth (bgs)	Results (ppm)
SB 10	0 to 5feet	6.2
MW7SA	0 to 5 feet	5.5

(PAS-00032616, 19)

Benzo(k)fluoranthene NJDEP Non-residential Direct Contact Soil Cleanup Criteria = NE		
Sample No.	Depth (bgs)	Results (ppm)
SB 10	0 to 5 feet	6.6

(PAS-00032616)

A March 4, 2011, Deed Notice states that engineering controls have been implemented to prevent direct contact to underlying PAHs and metals in soils attributed to the underlying slag and historic fill materials across the site (PAP-00190095; PAP-00190123).

Mercury

According to the 1991 Administrative Consent Order (ACO), on September 24, 1986, NJDEP conducted sampling of the facility site. On October 30, 1986, soil sample results revealed that the onsite soils were contaminated with 10 ppm of mercury (PAS-00003779). Note: The 1991 ACO did not provide further details regarding depth and location of the samples. The 1986 NJDEP sampling report was not available for review for this report. Note: The copy of the 1991 ACO provided for this report was an incomplete copy.

According to the 1996 Rev. Phase II RIWP, mercury was not detected above the NJDEP Non-residential Direct Contact Soil Cleanup Criteria (i.e., 270 ppm) during the March 1993 soil sampling event (PAS-00032615-19).

Copper

The October 30, 1986, soil sample results revealed that the onsite soils were contaminated with 17,200 ppm of copper (PAS-00003779). Note: The 1991 ACO did not provide further details regarding depth and location of the samples. The 1986 NJDEP sampling report was not available for review for this report. Note: The copy of the 1991 ACO provided for this report was an incomplete copy.

According to the 1996 Rev. Phase II RIWP, the following results for copper were reported above the NJDEP Non-residential Direct Contact Soil Cleanup Criteria (i.e., 600 ppm) from the March 1993 soil sampling event:

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Copper NJDEP Non-residential Direct Contact Soil Cleanup Criteria = 600 ppm		
Sample No.	Depth (bgs)	Results (ppm)
SB 1A	0 to 0.5 feet	809
SB 3	0 to 0.5 feet	5,120
SB 4	0 to 0.5 feet	7,160
SB 5A	0 to 0.5 feet	926
SB 5B	0 to 0.5 feet	2,170
SB 6	0 to 0.5 feet	13,200
SB 7A	0 to 0.5 feet	1,560
SB 8	0 to 0.5 feet	26,600
SB 9	0 to 0.5 feet	4,420
SB 10	0 to 0.5 feet	10,800
SB 11	0 to 0.5 feet	9,780
SB 12	0 to 0.5 feet	5,640
SB 14	10 to 10.5 feet	1,210
SB 15	11.5 to 12 feet	739
MW3S	0 to 0.5 feet	4,660
MW4S	0 to 0.5 feet	4,070
MW4D	0 to 0.5 feet	4,220
MW5S	0 to 0.5 feet	19,300
MW5S	10 to 10.5 feet	3,180
MW6S	0 to 0.5 feet	24,100
MW7SA	0 to 0.5 feet	1,930
MW7SB	0 to 0.5 feet	1,130
MW7S	8.5 to 9 feet	2,130
MW7D	0 to 0.5 feet	8,710
MW7D	6 to 6.5 feet	2,490

(PAS-00032615-19)

Lead

The October 30, 1986, soil sample results revealed that the onsite soils were contaminated with 15,300 ppm of lead and other metals (PAS-00003779). Note: The 1991 ACO did not provide further details regarding depth and location of the samples. The 1986 NJDEP sampling report was not available for review for this report. Note: The copy of the 1991 ACO provided for this report was an incomplete copy.

According to the 1996 Rev. Phase II RIWP, the following results for lead were reported above the NJDEP Non-residential Direct Contact Soil Cleanup Criteria (i.e., 600 ppm) from the March 1993 soil sampling event:

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Lead NJDEP Non-residential Direct Contact Soil Cleanup Criteria = 600 ppm		
Sample No.	Depth (bgs)	Results (ppm)
SB 3	0 to 0.5 feet	1,820
SB 4	0 to 0.5 feet	1,070
SB 5B	0 to 0.5 feet	3,280
SB 6	0 to 0.5 feet	3,420
SB 9	0 to 0.5 feet	942
SB 10	0 to 0.5 feet	2,140
SB 11	0 to 0.5 feet	2,000
SB 12	0 to 0.5 feet	2,620
MW2S	0 to 0.5 feet	787
MW2S	8 to 8.5 feet	2,610
MW3S	0 to 0.5 feet	2,750
MW4S	0 to 0.5 feet	1,180
MW4D	0 to 0.5 feet	1,240
MW5S	0 to 0.5 feet	3,570
MW5S	10 to 10.5 feet	1,560
MW6S	0 to 0.5 feet	2,520
MW7SA	0 to 0.5 feet	671
MW7SB	0 to 0.5 feet	1,170
MW7D	0 to 0.5 feet	2,500
MW7D	6 to 6.5 feet	896

(PAS-00032615-19)

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.¹

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.² Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.³ PAHs,

¹ *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, <https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm>, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

² *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

³ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

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lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.⁴

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

The following table shows the 1993 results from soil sampling (PAS-00032615-19):

COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	3,570 mg/kg
Copper	26,660mg/kg
Mercury	5.02 mg/kg
Benzo(a)anthracene	8.6 mg/kg
Benzo(a)pyrene	7.2 mg/kg
Benzo(b)fluoranthene	6.2 mg/kg
Benzo(k)fluoranthene	6.6 mg/kg
Dibenzo(a,h)anthracene	0.47 mg/kg
Indeno(1,2,3-cd)pyrene	2.7 mg/kg

According to the 1996 Rev. Phase II RIWP, the area in which the site lies was originally marsh land that was reclaimed by filling for the express purpose of industrial development (PAS-00032552). Based on the “historical maps and aerial photos reviewed the majority of the site was filled between 1908 and 1938. Portions of the site along Harrison Ave were filled as early as the 1890s. By 1938 the site filling was completed, and the surface of the site was similar to its present condition....he southern end of the lagoon has been filled over the years reducing the lagoon to its current extent” (PAS-00032553-54).

5. COC Pathways

Sanitary Sewer

According to the *Analysis and Evaluation of Potential Discharges to the Passaic River* report, dated August 2010 (2010 Report), with the exception of the furnace building, all of the buildings on-site were connected to the municipal sanitary sewer system from the time of their construction. All of these buildings discharged sanitary waste only; none had process or industrial discharges. In 1996, the furnace building sanitary discharges were connected to the municipal sanitary sewer system. Verbal approval to connect the plant washrooms with the municipal sewer was given to KSRC by Mr. Mike Petriello, the plumbing inspector with the Town of Kearny construction code office (PAP-00004545).

⁴ NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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Storm Sewer

A September 22, 1989, letter from NJDEP states that the stormwater runoff from the facility was discharging to the surface waters of the state via a newly installed storm drain and sewer (PAP-00004631).

According to the 2010 Report, KSRC was issued a Stormwater Discharge Permit (No. NJ0120073) on May 28, 2001 (effective date: August 1, 2001) (PAP-00004546). There are two stormwater discharge points on the site: DSN-001A is an on-site discharge of stormwater runoff to the lagoon; DSN-002A is a discharge to the municipal storm sewer on Harrison Ave. The Harrison Avenue storm sewer discharges to the Passaic River. DSN-002A is part of an on-site storm sewer which drains the western portion of the site. As such, it receives runoff from building roofs and paved surfaces only. In all of the stormwater discharge monitoring samples collected from DSN-002A since the Permit was issued, the concentrations of all the metals were below the NJ surface water quality standards. Based on the discharge monitoring analytical data, there has been no discharge of contaminants at concentrations exceeding the surface water quality standards to the municipal storm sewer system (PAP-00004546).

According to the 2010 Report, historically, the KSRC lagoon was used as a settling pond for acetylene manufacturing waste water from the S.O.S. Gases facility located adjacent to KSRC on Harrison Avenue. In addition, the lagoon supplied both contact and non-contact cooling water to the KSRC plant. The lagoon also received discharges from the KSRC quality control laboratory. All of these discharges were ceased in 1995; there were no process-related discharges to the lagoon at the time of the report. Although historic process-related discharges to the lagoon did result in contamination of the lagoon water and sediment, no off-site migration or discharge of water from the lagoon occurred because there is no surface water pathway to the surrounding environment (PAP-00004536).

The 2010 Report states that since 2001, on-site groundwater concentrations of cadmium, lead, and zinc continued to decrease; contaminants from off-site upgradient sources continued to migrate onto the site, but due to attenuation are reduced to concentrations below the GWQS on-site; and there has been no migration of contaminants from KSRC to the surrounding area (PAP-00004544).

The 2010 Report concludes that KSRC's process-generated contaminants remain on-site, and do not migrate off-site via groundwater, surface water, movement of soil, or discharges to the municipal sewer systems (PAP-00004533).

Direct Release

According to the 1995 RIWP, there has been filling at the facility related to the construction of railroads located near the northern border of the facility consisting of earth materials mixed with coal combustion ash and cinders. The report also states that an 1871 railroad map shows a number of man-made drainage ditches in the area then occupied by the smelter building and the lagoon. The ditches are noted not to have crossed Harrison Ave, but appear to have drained to Frank Creek approximately 1,000 feet to the east of the site. By 1896, these ditches are no longer present and the marsh

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line had moved eastward from its 1839 location. In addition, the construction of the DL&W embankment created two ponded areas—one of which was the KSRC lagoon. A 1938 Map showed that the entire area had been filled by that time with the exception of the lagoon and that the lagoon was landlocked (PAP-00190059-60). Logs from soil borings and monitoring wells stated that the fill material was heterogeneous and that the most common materials found in the fill were brick, concrete, asphalt, wood and glass (PAP-00190060).

The 1995 RIWP states that the KSRC lagoon was used historically to supply both contact and non-contact cooling water to the plant. Cooling water was circulated through the systems requiring cooling and discharged to the lagoon. In addition, the lagoon received discharges from a small quality control laboratory located in the northeast corner of the plant, and from the billet casting pit (PAP-00190078).

A March 10, 1998, letter from JMZ Geology to NJDEP states that the discharge of contact cooling water from the ingot conveyor pit to the lagoon located to the northeast of the plant was ceased in 1995. It also notes that non-contact cooling water from the extrusion line heat exchanger, formerly discharged to the lagoon, was currently being supplied by a closed loop system with water from the contact cooling water holding tank and there were no longer any discharges to either surface or groundwater (PAP-00004665).

A July 10, 1991, letter to NJDEP from KSRC counsel states that he had personally inspected the facility and it was not draining into Frank's Creek and ultimately the Passaic River, as the facility does not border Frank's Creek. It notes that the lagoon on site is completely landlocked (PAP-00004634).

Spills

On October 23, 1987, the Hudson Regional Health Commission sent KRSC a Notice of Violation for a discharge of a hazardous substance (No. 4 Fuel Oil). The oil leak was from the pipes in the pump house which caused approximately 100 to 150 gallons of No. 4 Fuel Oil to spill to the ground (PAS-00032753-55). See further discussion in Section 6 - Regulatory History/ Enforcement Actions and Section 7 - Remedial Activities.

Groundwater

According to the 2010 Report the following five potential discharges to groundwater were formerly present at the KSRC:

Septic Systems

The two septic systems were hooked up to the furnace building and discharged directly to groundwater. One of the septic systems was located to the north of the building and served the office lavatory; the second was located near the southeast corner of the building and served the employee shower room.

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Laboratory Sink Discharge

The sink in the facility QA laboratory originally discharged small amounts of spent acids and wash water to the lagoon. In 1995, the lab sink was reconfigured to receive only wash water and condensate from lab equipment and was connected to the office septic system.

Non-Contact Cooling Water

Non-contact cooling water from the extrusion line heat exchanger was also formerly discharged to the lagoon. This practice was also ceased in 1995. The non-contact cooling water is now supplied by a closed loop system with water from the cooling water holding tank. Make-up water is obtained from municipal supply.

Contact Cooling Water

Contact cooling water from the ingot conveyor pit was also formerly discharged to the lagoon. This discharge was ceased in 1995 when new cooling water systems were put into operation. At that time, contact cooling water was pumped to a cooling tower and holding tank located outside of the south wall of the furnace building. Make-up water was obtained from municipal supply. Therefore, there have been no discharges of contact cooling water from that date. In March 2000, ingot manufacturing was ceased and the rotary furnace was taken out of service. The use of contact cooling water ceased at that time.

Exposure of Process Raw Materials and Wastes at the Site Surface

Process raw materials were formerly stored uncovered on gravel paved areas to the south and east of the furnace building. Zinc oxide, a by-product of the ingot manufacturing process, was collected in a baghouse and stored in a shed, both of which were also located to the south of the furnace building. Slag, the waste material of the ingot manufacturing process, was cooled and subsequently crushed in a gravel-paved area to the southeast of the furnace building. In all of these areas, the potential existed for process contaminants to migrate to groundwater through surface water infiltration (PAP-00004536-39).

6. Regulatory History/Enforcement Actions

Permits

KSRC was issued a Stormwater Discharge Permit (No. NJ0120073) on May 28, 2001 (effective date: August 1, 2001). One of the two stormwater discharge points was to the Passaic River (PAP-00004546).

A Soil Remediation Action Permit (RPC 000001) was issued to KSRC on May 16, 2011. The permit required monitoring and maintenance pursuant to Exhibit C of the attached Deed Notice. In addition, it required periodic inspections of any excavations or disturbances that resulted in unacceptable exposure of the soil contamination (PAP-00190090-91).

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Inspections/Violations

An inspection conducted at KSRC in January 1984 observed that there were numerous empty and damaged drums stored in the rear of the property. In addition, wastewater was being discharged into the surface or groundwater of the state including overflow from the cooling tower and settling tanks and a surface impoundment used to collect wastewater discharged from the facility. The facility did not have an NJPDES permit at the time (PAS-00003772-73).

On April 14, 1986, NJDEP conducted an inspection of the facility which revealed the mismanagement of hazardous waste and/or solid waste including mounds of incinerator ash, hundreds of metal drums, and transformers on the eastern side of the building, as well as poor housekeeping throughout the site (PAS-00003779).

On October 23, 1987, the facility was issued a Notice of Violation from the Hudson Regional Health Commission for discharge of a hazardous substance (No. 4 oil) and discharge of hazardous substances lead and zinc into surface water (lagoon) (PAP-00004626). A December 16, 1987 letter to the facility from NJDEP states that the facility had been inspected on October 27 and November 5 and that wastewater originating from contact and non-contact cooling water, contaminated storm water runoff, laboratory waste, and a venture air pollution scrubber device was being discharged to an on-site drainage ditch and surface impoundment. The wastewater was noted to ultimately discharge to the groundwater of the State (PAP-00004628).

On December 3, 1990, an investigation at the facility was conducted by NJDEP and the New Jersey State Police. Sampling conducted at this time revealed the presence of zinc, lead and cyanide in the lagoon. The Department maintained that the zinc and lead were the result of a leaking scrubbing device (PAS-00003781).

On October 11, 1991 KSRC entered into an ACO to address the violations that had occurred throughout the years of operation. KSRC was ordered to conduct a Remedial Investigation and Feasibility Study to determine the nature and extent of the problem presented by the discharging of pollutants and hazardous substances at and around the site and the mismanagement of wastes (PAS-00003777-81). Note: The copy of the 1991 ACO provided for this report was an incomplete copy.

An Investigation Report dated December 27, 1994, states that the facility had not implemented best management practices (BMPs) for its General Stormwater Permit. Raw material, scrap, product, slag, and waste was still exposed to stormwater. A bypass line from the contact cooling pit was eventually discharging to the storm sewer. The findings note that the facility was no longer using its lagoon for water for contact cooling water for the ingot furnaces and molds (PAS-00003766).

A July 7, 2010, NJDEP Notice of Deficiency states that concentrations of lead, cadmium and zinc were consistently well above the GWQS in eight sampling episodes. It notes that the Department recognized that groundwater contamination at MW-9 was representative of background contamination levels, but since contaminant levels for cadmium and lead at MW-13 were greater than the levels measured at MW-9, they

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considered that an onsite source (lagoon) had been contributing to a portion of the groundwater contamination detected beneath the KSRC facility (PAP-00004672-73).

According to the 2018 Phase I ESA, on October 12, 2012, a site-wide, restricted use Response Action Outcome (RAO) letter was issued for the KSR site. The RAO includes Block 275, Lots 1B and 2A and Block 276, Lots 1B, 1C and 3 (PAP-00431839). Note: The 2012 RAO was not provided for this review.

As part of the 2018 Phase I ESA, site observations were conducted in order to obtain information indicating the likelihood of Recognized Environmental Conditions (RECs) to be present at the site. RECs are defined in the ASTM Standard Practice E 1527-13 as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. The following were determined as RECs:

- Two Abandoned in Place Underground Storage Tanks (USTs)
- Former Rail Line Spur
- Former Solvent Aboveground Storage Tanks (ASTs)
- Former Auto Junk Yard
- Vinnie's Sunoco, including the following:
 - Soil and groundwater contamination associated with previously removed gasoline USTs
 - Groundwater contamination associated with previously removed 5,000-gallon No. 2 fuel oil or diesel fuel UST
 - Suspected offsite groundwater plume migration onto subject site (PAP-00431830)

The following table summarizes the recommendations reached during the 2018 Phase I ESA:

REC/BER	Recommended Action
Filled in Place USTs	Peak recommends site investigation surrounding abandoned in place USTs
Kearny Smelting & Refining Corp (KSR)	Peak recommends the continued monitoring, maintenance, and evaluation for compliance and effectiveness of the CEA institutional control and the filing of Remedial Action Protectiveness/ Biennial Certification Form (Groundwater) in accordance with NJDEP regulations
Vinnie's Sunoco	Peak recommends additional soil and groundwater investigations for impacts associated with Site operations, as well as, potential migration of contaminated groundwater from an offsite source
Two Abandoned in Place USTs	Peak recommends a Phase II site investigation to evaluate potential impacts associated with this REC.

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REC/BER	Recommended Action
Former Rail Line Spur	Peak recommends a Phase II site investigation to evaluate potential impacts associated with this REC.
Former Solvent ASTs	Peak recommends a Phase II site investigation to evaluate potential impacts associated with this REC.
Former Auto Junk Yard	Peak recommends a Phase II site investigation to evaluate potential impacts associated with this REC.
Potential Heating Oil USTs Associated with Former Structures	Peak recommends a geophysical survey in the areas of the former buildings to investigate for obvious evidence of USTs or excavation areas from former USTs

(PAP-00431840-41)

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Draft Remedial Investigation Report* dated November 1993 (PAS-00003790)
- *Phase II RI Workplan* dated October 1995 (PAP-00190051)
- *Revised Phase II RI Workplan* dated August 1996 (PAS-00032543)
- *Phase I Environmental Site Assessment* dated April 13, 2018 (PAP-00431824)

The 1993 *Draft Remedial Investigation Report* (RIR) (1993 Draft RIR) states that soil analytical data demonstrated that copper and other metals were not in compliance with current soil cleanup criteria and lead was detected in one well. However, it notes that after 50 years of operation, the impact of the on-site metal contamination in the soils is insignificant in relation to the groundwater and surface water qualities (PAS-00003796). It also states that the water in the lagoon was likely adversely impacting the groundwater quality in the shallow perched zone surrounding the lagoon (PAS-00003799). Note: The pdf of the 1993 Draft RIR was an incomplete version of the report. Neither a complete copy of the Draft nor the Final RIR was available for review for this report.

The 1995 RIWP, states that based on previous investigations the following conclusions can be drawn:

- Site soils have been adversely impacted by metals, PAHs and PCBs through both current and historical on-site processes and the historical filling of the site.
- In general, historical fill and process related soil contamination are indistinguishable due to the presence of similar constituents.
- Lagoon sediments contain contaminants that are derived from run-off, KSRC's processes, and sources unrelated to KSRC.

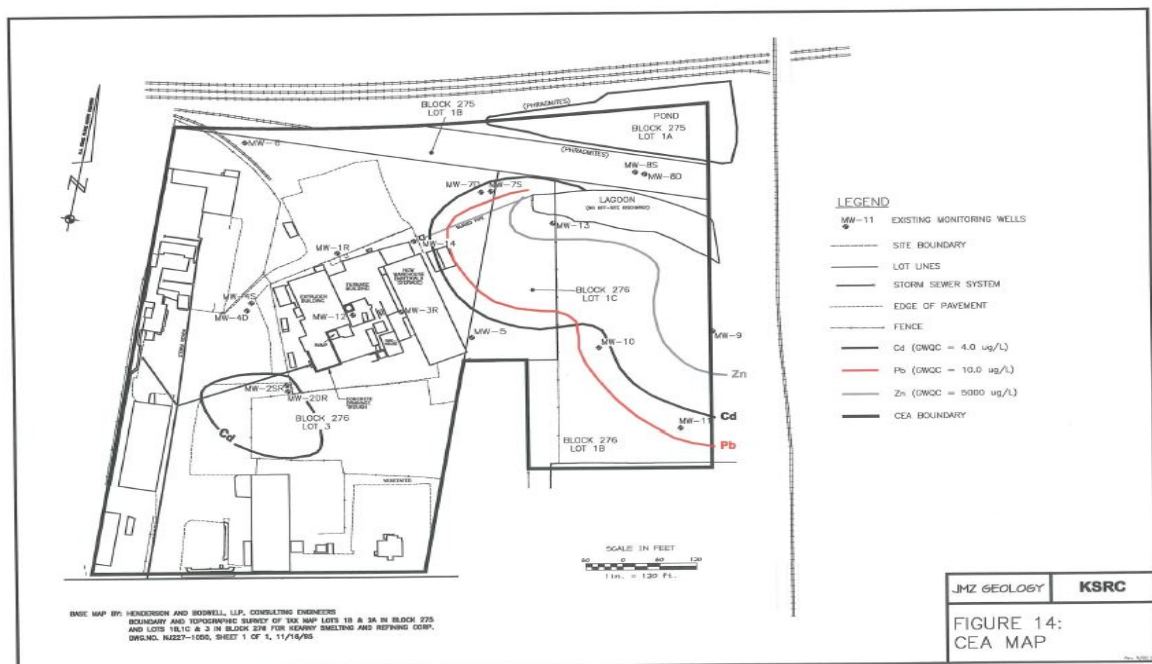
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- The shallow and deep groundwater zones are in communication and both have been contaminated with lead and other metals.
- Discharges to the septic tanks and the lagoon have contributed to shallow groundwater contamination.
- Shallow groundwater flow is currently dominated by a recharge area located beneath the smelter building. (PAP-00190077)

KSRC submitted the 1996 Rev. Phase II RIWP, to address comments received from NJDEP regarding the 1995 RIWP. The purpose of this 1996 Rev. Phase II RIWP was to obtain additional environmental quality information and to complete the characterization of the site (PAS-00032549).

In the Justification for Recommendation of No Further Action letter dated August 3, 2009 (2009 Letter), it is stated that a RAW/CEA, was submitted to NJDEP on September 29, 2000. The RAW/CEA was focused on the use of monitored natural attenuation for those groundwater contaminants "which result from KSRC activities" – cadmium, lead and zinc. The 2009 Letter states that on-site groundwater monitoring demonstrated that all contaminant concentrations, both those originating on-site as well as those from off-site sources were reduced to levels below the GWQS before reaching the downgradient site boundary. It also notes that there was no off-site migration of contaminants at that time (PAP-00004550-52).

The 2009 letter included the following figure from the 2000 RAW/CEA workplan shows the CEA site boundary, monitoring well locations, and the locations of the lead, cadmium, and zinc plumes.



(PAP-00004558)

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According to the 2010 Report, the only water that could have migrated from the property to the River was stormwater collected on Harrison Avenue. Stormwater sampling pursuant to KSRC's permit reflect that the samples were always below permit limits and surface water quality standards (PAP-00004546).

On February 16, 2011, NJDEP approved the Revised RAW stating the workplan was in compliance with the Technical Requirements for Site Remediation, N.J.A.C.7:26E and other applicable requirements. NJDEP concluded that there was insufficient evidence in the groundwater data to conclude that arsenic and nickel are derived exclusively due to migration from offsite sources. The CEA was to include arsenic and nickel as COCs in addition to cadmium, lead and zinc in accordance with TRSR N.J.A.C. 7:26E-8.3(a) (PAP-00217360).

Remedial Activities

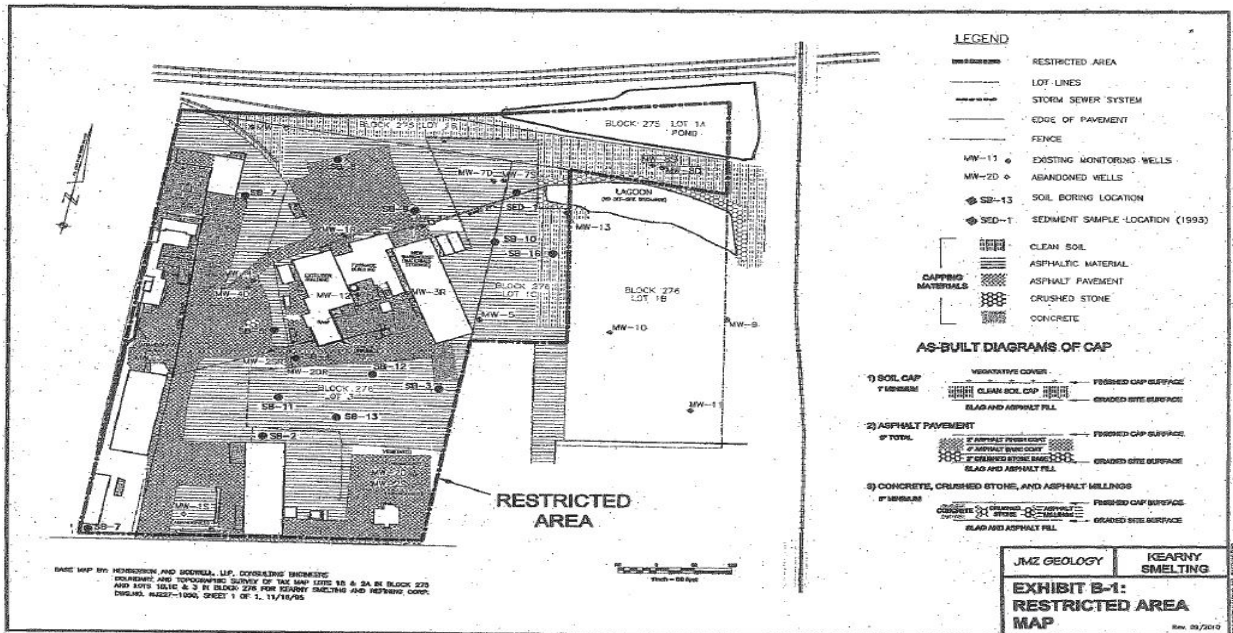
In a letter report dated December 4, 1987, KSRC informed NJDEP that upon receipt of the Notice of Violation for No. 4 Oil Fuel spill, the clean-up procedure started with the removal of the pump and pump house. Once removed, an area of approximately 17 feet by 30 feet with a depth of 2 feet was excavated. When the odor of fuel could no longer be detected, digging stopped and five samples were taken; one from each corner and one from the center of the excavation area. Further excavation was required and a total of 16,200 pounds of soil was removed from the excavation area. The samples were analyzed for Total Petroleum Hydrocarbons but not for PAHS (PAS-00032755-56).

The 2009 Letter states that a conceptual Remedial Action Work Plan (RAW) was submitted to NJDEP in May 1997 and was implemented in 1997/1998. Post-remedial groundwater monitoring was also conducted in 1997/1998. Additional groundwater monitoring was conducted during 1999 and 2000. Groundwater monitoring results demonstrated that the capping of the site combined with many other site improvements and process modifications had significantly reduced the concentrations of metals in groundwater across the property (PAP-00004534; PAP-00004549-50).

A March 4, 2011, Deed Notice states that engineering controls have been implemented to prevent direct contact to underlying PAHs and metals in soils attributed to the underlying slag and historic fill materials across the site. The primary control is a cap composed of clean soil, asphalt pavement, concrete, and crushed stone or asphaltic millings (PAP-00190095, 123). See the following site map that shows the restricted area of the site and composition of the cap.

Kearny Smelting

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(PAP-00190112)

According to the 2018 Phase I ESA, "On December 20, 2016, a deed notice termination was submitted to the NJDEP for the redevelopment of a portion of the property for new commercial uses. The existing structures will be razed and new structures will be constructed. On January 26, 2017, the NJDEP approved the deed notice termination. Once the construction is complete and the new caps are in place, the Deed Notice Termination will be filed with the county along with a new deed notice to describe and incorporate the new caps. A modified SRAP [Soil Remedial Action Permit] application will be required after the new deed notice is filed with the county. During redevelopment, construction activities will need to be monitored to ensure that contaminated soil is properly handled and disposed, if required. The new engineering controls/caps will need to be approved by the Licensed Site Remediation Professional (LSRP)" (PAP-00431839). Note: The 2016 Deed Notice Termination and the NJDEP approval was not available in the documents reviewed for this report.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

Leemilt's Petroleum Inc.

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Leemilt's Petroleum Inc.

Facility Name, Address and Size: Leemilt's Petroleum Inc. (successor by merger to Power Test of New Jersey, Inc.); 86 Doremus Avenue, Newark, New Jersey 07114 (the Newark Terminal); 15.3 acres (PAP-00084077; PAP-00086173); another source states the property is 14.5 acres (PAP-00066677); no information was available in the file material regarding the number of employees that worked at the Newark Terminal. The property is referred to as both the Getty Terminal and the Newark Terminal in the file materials, but is referred to as the Newark Terminal in this Data Report.

1. **Business Type:** Former bulk petroleum storage and distribution terminal (PAP-00066676; PAP-00066932).

2. **Time Period of Ownership/Operations**

Operator: Operators vary by source, but include the following:

- Clay Terminals (an affiliate of Leemilt's Petroleum Inc.) 1985-1997
- Getty Petroleum Marketing, Inc. (GPML, an unrelated entity) 1997-2012
- Getty Terminals 1985-2011 (PAP-00066678).

Owner: Power Test Realty Company Limited Partnership (PTRC, an affiliate of Leemilt's Petroleum Inc.) 1985-September 18, 2013 (PAP-00084077).

The tables below present a list of owners and operators identified in the *Preliminary Assessment/Site Investigation Report, Former Getty Terminal 56230*, dated March 2014 (PA/SIR) (PAP-00084082):

Name of Operator / Use	From	To
Vacant	2012	Present
Getty Petroleum Marketing Inc.	1984	2012
Texaco Refining and Marketing, Inc.	1960	1984
Tide Water Associated Oil Co	~1952	1960
The Atlantic Refining Company	Before 1950	~1952
Loujac Co.	Before 1931	~1950

Name of Property Owner	From	To
125 Doremus Avenue, LLC	9/18/2013	Present
Power Test Realty Co. Ltd. Partnership	2/1/1984	9/18/2013
Texaco Refining and Marketing, Inc.	1960	1984
Tide Water Associated Oil Co. (1952)	~1952	1960
The Atlantic Refining Co. (1950)	Before 1950	~1952
Loujac Co. (1931)	Before 1931	~1950

Pre-1931: A 1931 Sanborn Map shows that the property located at 86 Doremus Avenue was owned by Loujac Co. and the buildings in the West Yard were vacant

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- (PAP-00084169). According to the 1931 Sanborn Map, one building in the East Yard is labeled MFG Lacquers and one building is labeled MFG soap (PAP-00084169). There is no additional information regarding any prior use and/or ownership of the property by Loujac Co in the available file materials.
- 1930: Newark Terminal was constructed for use as a petroleum storage and distribution facility by the Atlantic Refining Company, which operated the facility until approximately 1950 (PAP-00432453, PAP-00066677).
- 1931: The Newark Terminal was owned by Loujac Co. and all buildings in the West Yard were vacant. The buildings in the East Yard were used for manufacturing of soap and lacquers (PAP-00084077).
- 1950: Newark Terminal was acquired by The Tidewater Associated Company and was operated by Getty Refining and Marketing Company (GRMC) (PAP-00066677).
- 1960s: The Tidewater Associated Company merged with the Getty Oil Company (PAP-00066677).
- 1984: Texaco Inc. acquired the Getty Oil Company in January 1984, and GRMC was re-named Texaco Refining and Marketing Inc. (TRMI) (PAP-00066677).
- 1984: On December 21, 1984, Texaco Inc., and its affiliated entity TRMI, sold the Newark Terminal to PTRC (an affiliate of Power Test Corp.) (PAP-00084080). The *Remedial Investigation Report, Former Getty Newark Terminal – Area A, 86 Doremus Avenue*, dated July 2014 (the Area A RIR) shows that PTRC was affiliated with Getty Properties Corporation and Getty Realty Corporation (PAP-00066677).
- 1985: Power Test of New Jersey, Inc. purchased the Newark Terminal from Texaco, Inc. in January 1985 and began its operation of the property (PAP-00020763). The Area A RIR states that Getty Terminals was responsible for operations from 1985 to 2011 (PAP-00066678).
- 1985: In January 1985, TRMI entered into an administrative consent order (ACO) with NJDEP requiring TRMI to investigate and remediate existing contamination at the Newark Terminal under the Environmental Clean-up and Responsibility Act (ECRA) (PAP-00020764; PAP-00066677).
- 1995: Power Test of New Jersey, Inc. merged into Leemilt's Petroleum Inc. on January 10, 1995 (PAP-00020762).
- 1997: GPML was spun off from Getty Petroleum Corporation as a separate, publicly listed company (PAP-00432452). Getty Petroleum Corporation changed its name to Getty Realty Group on March 21, 1997 (PAP-00020762).
- 2001: On October 9, 2001, Chevron Corporation (Chevron) and Texaco Inc. merged to form the Chevron Texaco Corporation (PAP-00020762).

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2011: GPMI filed for bankruptcy in December 2011 (PAP-00432452). Getty Terminals entered bankruptcy proceedings in 2011 (PAP-00066678). Another source states that GPMI filed for bankruptcy in December 2012 (PAP-00084077).

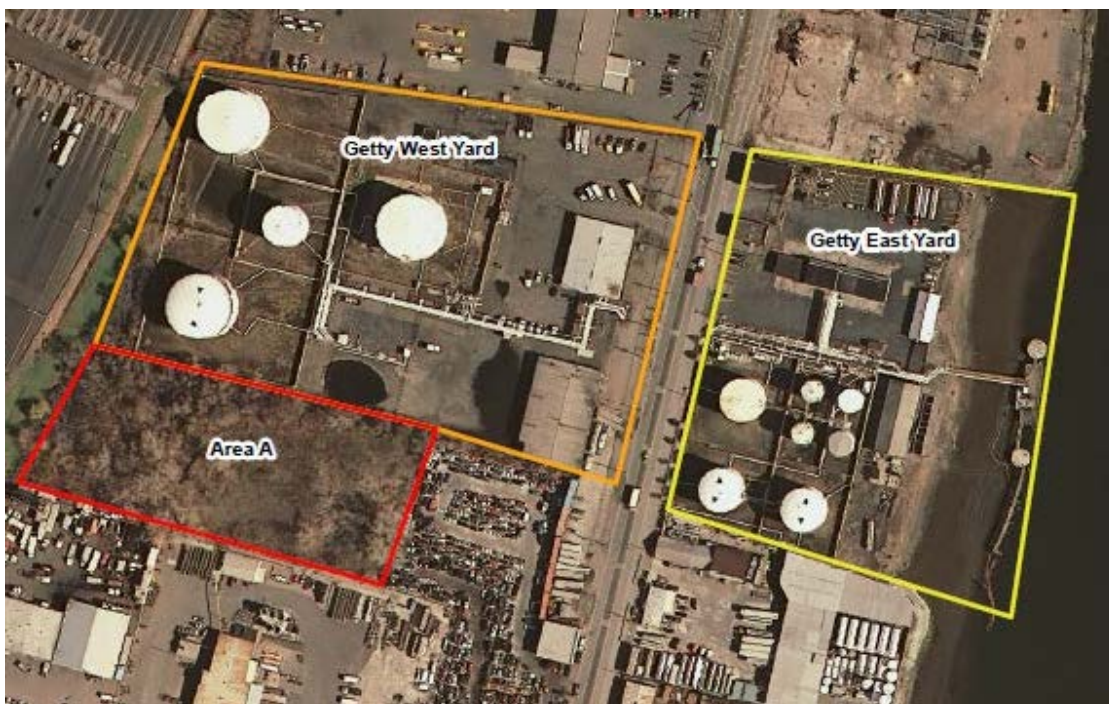
2011/2012: Getty Realty/PTRC took over the Newark Terminal (PAP-00066678).

2012: Site operations ceased in 2012 following the bankruptcy of GPMI (PAP-00083961; PAP-00084077).

2013: On September 18, 2013, PTRC sold the Newark Terminal to 125 Doremus Avenue, LLC (PAP-00066678; PAP-00084080-81).

3. Operational History/COC Use and Presence at the Facility

The Newark Terminal is bounded on the east by the Passaic River, on the west by Interstate 95, and on the north and south by industrial properties (PAP-00083963). Doremus Avenue bisects the property. The Newark Terminal consisted of an area known as the "East Yard" (bounded by the Passaic River and Doremus Avenue) and an area known as the "West Yard" and Area A (bounded by the New Jersey Turnpike/Interstate 95 and Doremus Avenue) (PAP-001661116). The East Yard is identified as Block 5011, Lots 8, 8.01, 8.02 and 8.03, and the West Yard and Area A are identified as Block 5010, Lot 7 (PAP-00066676), although another source identified the property as Block 5010, Lot 21 (PAP-00020762). Area A was formerly Lot 18 in Block 5010 but was later incorporated into Lot 7 (PAP-00066677). A figure presenting the site layout is provided below (PAP-00066705):



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According to the *Underground Storage Tank Remedial Investigation Report, Getty No. 56230 – Newark Terminal*, dated April 7, 2006 (UST RIR), the East Yard included two, two-story masonry office buildings, a one-story masonry building that housed the dispatch office and locker room facilities, a fuel loading rack, a foam building, a barge dock, several large capacity above ground storage tanks (ASTs), and multiple containment dikes (PAP-00083018).

The West Yard included an area known as Area A, which was a vacant parcel not used for facility operations (PAP-00066677). According to the *Underground Storage Tank Site Investigation Report, Getty Terminal (West Yard)*, dated February 28, 2003 (West Yard UST RIR), the West Yard included a one-story masonry automotive repair building and a one-story masonry warehouse (PAP-00082725).

The PA/SIR states that a review of historic maps and aerial photographs did not show any onsite wastewater treatment, septic systems, or discharge sources (PAP-00084090).

According to the West Yard UST SIR, a 1,000-gallon unleaded gasoline UST, three 54,000-gallon unleaded gasoline ASTs, and one 21,000-gallon No. 2 fuel AST were located at the West Yard (PAP-00082725). The table below presents a list of USTs at the Newark Terminal from the PA/SIR, reflecting the status as of 2014 (PAP-00084135):

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Tank	ADC #	Capacity (Gallons)	Contents	Status	Registered	Closure Number	NUDEP Case #	Yard	Location	Notes
Tank E1		2000	Leaded Gasoline	Removed (2/2/2006)	Yes	N05-4433	06-02-10-1135-08	Unknown	Unknown	
Tank E2	10	550 (registered as 500)	Waste Oil	Removed (2/21/1997)	Yes	TMS #C96-1146	97-2-21-1337-13	West	West of auto repair shop, same location as Tank 1	Post excavation soil samples contained TPHC concentrations ranging from 56,600 to 145,000 mg/kg.
Tank E3 (aka J)		4000	No. 2 Heating Oil	Current	Yes	--	--	West	West of auto repair shop	
Tank E4 (aka K)		4000	No. 2 Heating Oil	Current	Yes	--	--	West	North of warehouse	
Tank E5		2000	Unleaded Gasoline	Sump	Yes	--	--	Unknown	Unknown	
Tank 6	16	1000	Unleaded Gasoline	Removed (1/13/2003)	Yes	N02-1799	--	West	East of Tank #11 Basin	Tank in good condition without holes when removed but water and oil were present in tank.
Tank 7	17	1000	No. 2 Heating Oil	Removed (2/21/1997)	Yes	TMS #C96-1146	97-2-21-1736-36	East	East of northern office	Two corrosion holes when tank was removed.
A		Unknown	Unknown	Unknown	No	--	--	East	Northeast corner inside garage	Identified on historic maps, not discussed in text of historic reports.
E		2000 (previously reported as 1000)	No. 2 Fuel Oil	Removed (1/30/1986)	No	--	--	East	South of southern office, partially under chain link fence	Tank was filled with sand when removed, surrounding stained soil was excavated.
F		Unknown	Unknown	Unknown	No	--	--	Unknown	Unknown	Referred to in NUDEP letter from 4/13/1999, not discussed in text of historic reports.
G-1		2000	Diesel	Removed (1/29/1986)	No	--	--	East	North of locker room/dispatch office	Tank was filled with sand when removed and was corroded around seams, surrounding stained soil excavated.
G-2		2000	Unknown, discovered during removal of G-1	Removed (1/29/1986)	No	--	--	East	North of locker room/dispatch office under HVAC pad	Tank was filled with sand when removed and was corroded around seams, surrounding stained soil excavated.
H-1		2000	Oil	Removed (1/29/1986)	No	--	--	East	West of locker room/dispatch office	Tank was filled with sand when removed and was corroded around seams.
H-2		1500	Unknown, discovered during removal of H-1	Removed (1/30/1986)	No	--	--	East	West of locker room/dispatch office	Tank was filled with sand when removed and was corroded around seams.
I		1000 (previously reported as 100)	Waste Oil	Removed, replaced with 550-gallon Tank E2 (2/4/1986)	No	--	--	West	West of auto repair shop, same location as Tank E2	During tank removal, water with an oil layer was present in the UST.
L		2000	Unknown	Current	No	--	--	East	West of foam building	Fiberglass dropout tank, holds product during transfers for less than 24 hours.
M		2000	Unknown	Current	No	--	--	West	Between Sunoco shack and metal control building	Fiberglass dropout tank, holds product during transfers for less than 24 hours.
N		4000 (previously reported as 2000)	No. 1 Fuel Oil	Abandoned in place (abandoned prior to 1986, attempted to remove on 2/3/1986)	No	--	--	West	Outside southeast corner of auto repair shop	Not removed due to structural concerns with adjacent footings supporting overhead piping. Tank is filled with sand and abandoned in place.

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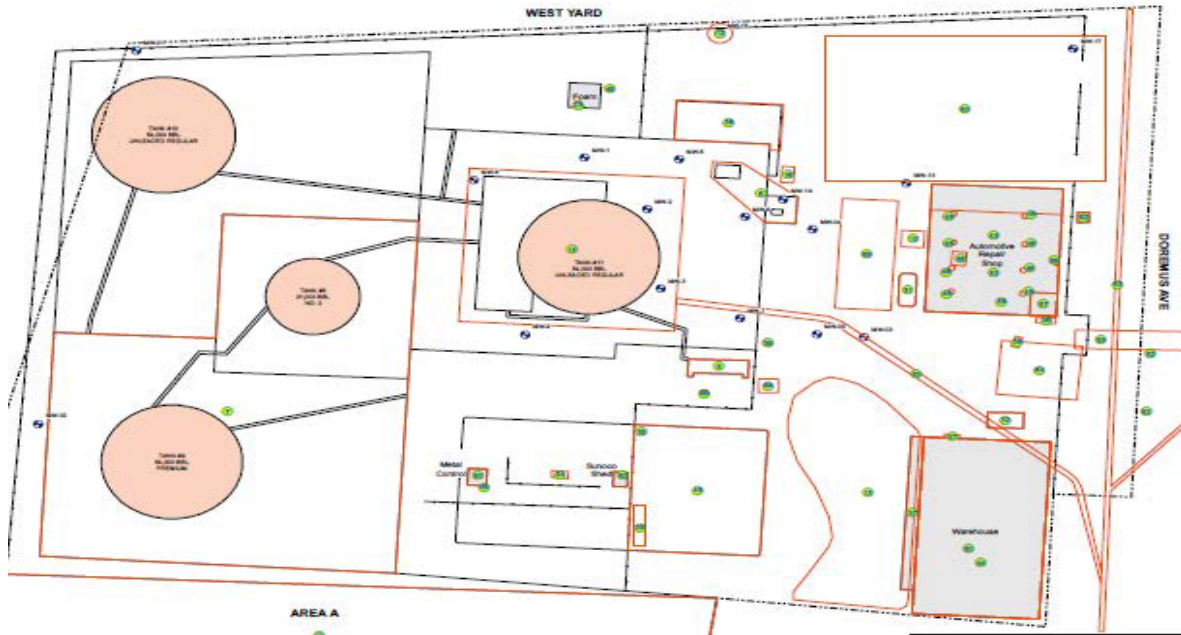
Figures depicting the features of the East Yard and West Yard are presented below (PAP-00084131-132):



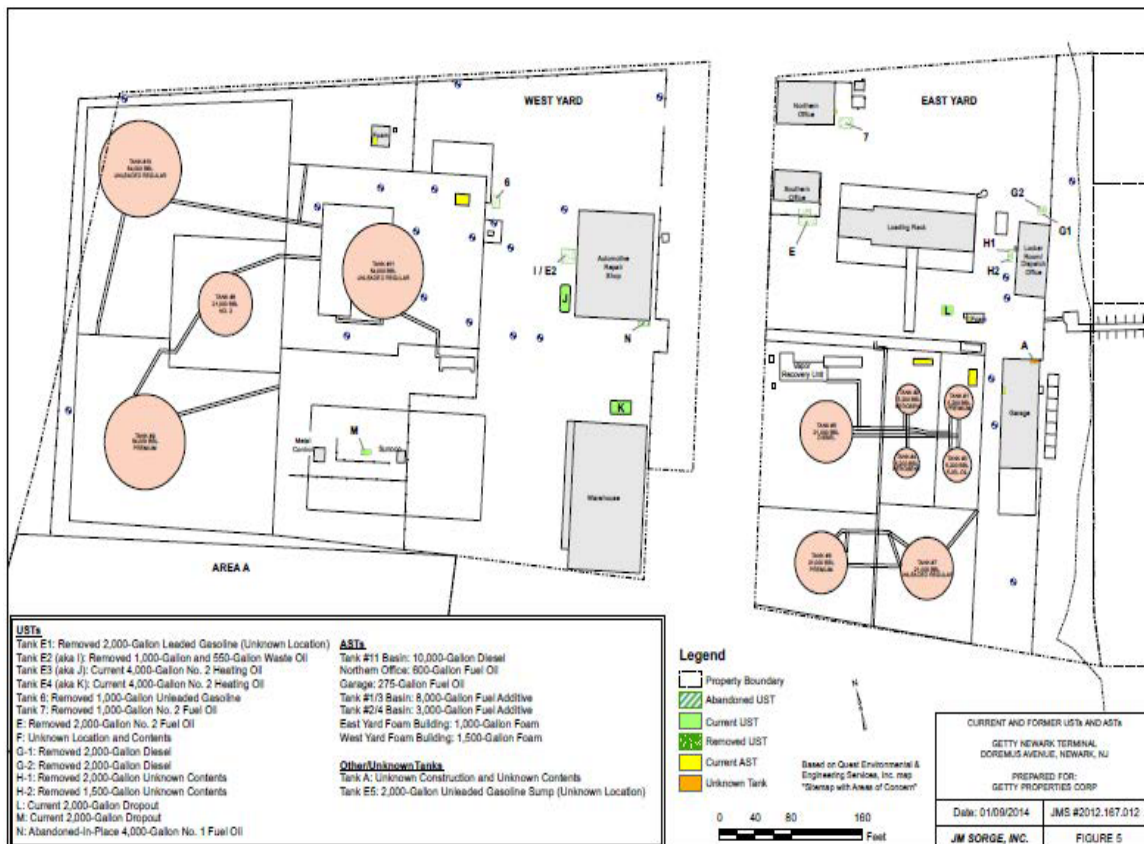
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A figure depicting the locations of ASTs and USTs at the Newark Terminal is presented below (PAP-00084133):



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The table below presents a list of hazardous materials stored or used at the Newark Terminal from the PA/SIR. The list of materials is based on NJDEP Community Right to Know (CRTK) Surveys for CRTK Facility ID Number 94156800000 (GPMI, 2010-2012) and CRTK Facility ID Number 61763700000 (Getty Petroleum Corporation, 1992-1997). No CRTK records were available for the period of 1998-2009 (PAP-00084086-90):

Material Name	CAS #	Max Inventory Range	Storage method	Location
(Ambitol) Diethylene Glycol		10,001 to 50,000 lbs	Steel Drums	East Yard Garage
(Ambitol) Dipotassium Phosphate		10,001 to 50,000 lbs	Steel Drums	East Yard Garage
(Ambitol) Ethylene Glycol		10,001 to 50,000 lbs	Steel Drums	East Yard Garage
(Lubrizol 8166) Alkylamine		10,001 to 50,000 lbs	AST	East Yard
(Lubrizol 8166) Ethylbenzene	100-41-4	10,001 to 50,000 lbs	AST	East Yard
(Lubrizol 8166) Isopropyl Alcohol	67-63-0	10,001 to 50,000 lbs	AST	East Yard
(Lubrizol 8166) Xylene	1330-20-7	10,001 to 50,000 lbs	AST	East Yard
(Lubrizol 8192) Ethylbenzene	100-41-4	10,001 to 50,000 lbs	AST	East Yard
(Lubrizol 8192) Xylene	1330-20-7	10,001 to 50,000 lbs	AST	East Yard
(Lubrizol 8195) Ethylbenzene	100-41-4	50,001 to 100,000 lbs	AST	East Yard
(Lubrizol 8195) Ethylhexanone		50,001 to 100,000 lbs	AST	East Yard
(Lubrizol 8195) Xylene	1330-20-7	50,001 to 100,000 lbs	AST	East Yard
(Lubrizol 8247) Xylene	1330-20-7	10,001 to 50,000 lbs	AST	East Yard
(Nalco 5302) Heavy Aromatic		1,001 to 10,000 lbs	Steel Drums	East Yard Garage
(Nalco 5302) Xylene	1330-20-7	1,001 to 10,000 lbs	Steel Drums	East Yard Garage
(Nalco 5312) Amine Fatty Acid		10,001 to 50,000 lbs	Portable Metal Container	East Yard Garage
(Nalco 5312) Amine Substituted R		10,001 to 50,000 lbs	Portable Metal Container	East Yard Garage
(Nalco 5312) Heavy Aromatic NA		10,001 to 50,000 lbs	Portable Metal Container	East Yard Garage
(Nalco 5312) Octyl Nitrate		10,001 to 50,000 lbs	Portable Metal Container	East Yard Garage
(Nalco 5312) Octylnitrate		10,001 to 50,000 lbs	Portable Metal Container	East Yard Garage
(Nalco 5313) Heavy Aromatic NA		10,001 to 50,000 lbs	Portable Metal Container	East Yard Garage
(Nalco 5330) Ethylbenzene	100-41-1	10,001 to 50,000 lbs	AST	East Yard
(Nalco 5330) Heavy Aromatic NA		10,001 to 50,000 lbs	AST	East Yard
(Nalco 5330) Naphthalene	91-20-3	10,001 to 50,000 lbs	AST	East Yard
(Nalco 5330) Xylene		10,001 to 50,000 lbs	AST	East Yard
(Valvtect Diesel Guard) Xylenes	1330-20-7	10,001 to 50,000 lbs	Steel Drums	East Yard Garage
(Valvtect) Diethylene Glycol		101 to 1,000 lbs	Steel Drums	East Yard
(Valvtect) Isooctyl Alcohol	26952-21-6	101 to 1,000 lbs	Steel Drums	East Yard
(Valvtect) Kerosene		1,001 to 10,000 lbs	Steel Drums	East Yard
(Valvtect) Propylene Glycol Methyl Ether A		1,001 to 10,000 lbs	Steel Drums	East Yard
(Valvtect) Trimethylbenzene	95-63-6	101 to 1,000 lbs	Steel Drums	East Yard
(Valvtect Diesel G 7RD) Cumene	98-82-8	10,001 to 50,000 lbs	Steel Drums	East Yard Garage
1,1,1-Trichloroethane	71-55-6	11-100 lbs	Can	West Yard Auto Repair Shop
1,2,4-Trimethylbenzene	95-63-6	2,500 to 4,999 lbs	AST	East Yard
Additive Puradd AP6000		2,500 to 4,999 lbs	AST	East Yard
Adhesives		1-10 lbs	Can	West Yard Auto Repair Shop
Calcium Arsenate	7778-44-1	100,000 to 499,999 lbs	Bag	East Yard Garage
Calcium Chloride		101 to 1,000 lbs	Bag	West Yard Warehouse

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Car batteries			Shelf	East Yard Dispatch Office
Chemguard C333 AR-Aqueous Film Forming			Tanks	East Yard Foam House
Cumene	98-82-8	1,001 to 10,000 lbs	Steel Drums	East Yard Garage and West Yards Warehouse
Denatured Fuel Ethanol		Greater than 10 million lbs	AST	East and West Yards
Diesel Additive		101 to 1,000 lbs	Steel Drums	East and West Yards
Diesel Additive Acetate		1,001 to 10,000 lbs	Steel Drums	East Yard Garage
Diesel Additive Isooctyl		101 to 1,000 lbs	Steel Drums	East and West Yards
Diesel Additive Kerosene		1,001 to 10,000 lbs	Steel Drums	East Yard Garage
Diesel Additive Monomethyl		101 to 1,000 lbs	Steel Drums	East and West Yards
Diesel Additive Trimethyl		101 to 1,000 lbs	Steel Drums	East and West Yards
Diesel Exhaust Fluid - DEF			Bulk Storage Containers	East Yard Garage
Diesel Fuel	68476-34-6	1 million to 10 million lbs	AST	East Yard
Ethyl Alcohol	64-17-5	1 million to 10 million lbs	AST	East Yard
Ethylene Glycol	107-21-1	10,001 to 50,000 lbs	Steel Drums	West Yard Warehouse
Fluorescent lamp bulbs			Box	East Yard Garage
Foam, Aqueous Film forming		10,001 to 50,000 lbs	Tank inside building	East Yard Foam House
Foam, Protein Hydrolysate		100,001 to 250,000 lbs	Tank inside building	West Yard Foam House
Gasoline, Leaded			ASTs	
Gasoline, Unleaded	8006-61-9	Greater than 10 million lbs	AST and UST	East and West Yards
Hazardous Waste		50,001 to 100,000 lbs	Steel Drums	East and West Yards
Hydrofluoric Acid	7664-39-3	11 to 100 lbs	Plastic bottles or jugs	West Yard Warehouse
Insecticide Gas (Non-Toxic)		Less than 1 lb	Can	West Yard Auto Repair Shop
John Zink Z-Seal Fluid		Unknown	Plastic drums	East Yard Garage
Karnak 71-AF Fibrated Asphalt Coating		Unknown	Can	East Yard
Kerosene			ASTs	East Yard
Lacquer			Unknown	East Yard
Methanol	67-56-1	10,001 to 50,000 lbs	Steel Drums	East and West Yards, East Yard Loading Rack
Methyl Ether	115-10-6	1,000 to 2,499 lbs	Steel Drums	East Yard
Mineral Spirits		1,001 to 10,000 lbs	Steel Drums	East Yard Garage and West Yard Warehouse
Multi-Purpose Gear Lubricant			Steel Drums	
Nalco 5403 Corrosion Inhibitor		Unknown	Steel Drums	West Yard Warehouse
Naphthalene	91-20-3	500 to 999 lbs	Steel Drums	East Yard
No. 2 Fuel Oil		Greater than 10 million lbs	AST and UST	East and West Yards
Paints, Enamel		10,001 to 50,000 lbs	Can	East Yard Garage and West Yard Warehouse
Petroleum Oils		50,001 to 100,000 lbs	Steel Drums	Warehouse West Yard
Petroleum Oils		250,001 to 500,000 lbs	Can	Warehouse West Yard
Polyurethane			Metal Cans	East Yard
Premium Gasoline			Tanks	East and West Yard
Propane	74-98-6	500 to 999 lbs	Cylinder	Auto Repair Shop
Propylene Glycol Monomethyl Ether	107-98-2	1,001 to 10,000 lbs	Steel Drums	East Yard Garage and West Yard Warehouse
Puradd AP-6000 Additive		3,000 gallons	AST	East Yard

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Sodium Arsenate	7631-89-2	1,000 to 2,499 lbs	Bag	East Yard Garage
Sodium Chlorate	7775-09-9	10,001 to 50,000 lbs	Bag	West Yard Warehouse
Sodium Chloride		101 to 1,000 lbs	Bag	East Yard Garage
Spirax 75W-90 Synthetic Axle Oil			Steel Drums	
Sulfuric Acid	7664-93-9	11 to 100 lbs	Plastic bottles or jugs	West Yard Warehouse
Tetrahydrofuran	109-99-9		Steel Drums	East Yard
Thinners		11 to 100 lbs	Can	Auto Repair Shop
Tolad 3880R Additive		Unknown	Tote Bin	West Yard Warehouse
Tolad 3881 Additive		5,000 to 9,999 lbs	Tote Bin	East Yard, West Yard Warehouse
Tolad 9110 Additive		Unknown	Unknown	East Yard
Trimethyl Benzene	15551-13-7	10,001 to 50,000 lbs	Steel Drums	East Yard Garage
Vinyl Acetate	108-05-4	2,500 to 4,999 lbs	Steel Drums	East Yard
Waste Oil			AST and UST	East and West Yards
Wax Liquid		11 to 100 lbs	Can	East Yard Broom Closet (Building Unknown)
Xylene	1330-20-7	1,001 to 10,000 lbs	Steel Drums, AST	East Yard Garage and West Yard Warehouse

4. Identified COCs

- PCBs (detected)
- PAHs (stored, detected)
- Copper (detected)
- Mercury (detected)
- Lead (stored, detected)

PCBs

Concentrations of total PCBs ranged from non-detect to 67 milligrams per kilogram (mg/kg) (PAP-00066714-15, 66).

The PA/SIR states that transformers were located in six locations at the Newark Terminal: three locations in the East Yard and three locations in the West Yard. Three wall-mounted transformers were located on the northern office building in the East Yard and appeared to be in good condition with no signs of staining or leaking. Three large pad-mounted transformers were located on a concrete pad, east of the northern office building. The transformers and pad had rust stains and the center transformer had black staining near the base and on the pad directly surrounding the transformer. One pad-mounted transformer was located on a concrete pad in the East Yard, adjacent to Doremus Avenue, which appeared to be in good condition with no significant stains on the transformer or the pad. There were two poles holding pole-mounted transformers in the West Yard, located adjacent to Doremus Avenue. One pole had three transformers and the second pole had one transformer. The pole-mounted transformers appeared to be in good condition with no signs of staining or leaking. A pad-mounted transformer was located on a concrete pad between the automotive repair show and Doremus Avenue, and appeared to be in good condition with no signs of staining or leaking. None of the transformers were labeled as PCB-containing (PAP-00084117-118).

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PAHs

According to the *Remedial Investigation Report, Former Getty Newark Terminal – Area A, 86 Doremus Avenue* (Area A RIR), PAH detections in soil are attributed to Historic Fill (PAP-00066685). Concentrations of PAHs in soil included benzo(a)anthracene, ranging from non-detect to 12 mg/kg; benzo(a)pyrene ranging from non-detect to 19 mg/kg; benzo(b)fluoranthene, ranging from non-detect to 23 mg/kg; benzo(k)fluoranthene, ranging from non-detect to 26 mg/kg; indeno(1,2,3-cd)pyrene, ranging from non-detect to 10 mg/kg; and dibenzo(a,h)anthracene, ranging from non-detect to 2.8 mg/kg (PAP-00066716-18).

Copper

Concentrations of copper in soil were as high as 2,030 mg/kg (PAP-00086279-296). No additional information regarding the presence or use of copper at the Newark Terminal could be located in the available file materials.

Lead

Paint was stored in one-gallon and five-gallon cans and stacked in plastic wrapped cardboard boxes on pallets located in a garage area at the East Yard of the Newark Terminal (PAP-00432453).

In addition, several racks of clear-cased batteries were stored at the Newark Terminal in connection with a telephone system and fire alarm system (PAP-00432453-54). The batteries were the approximate size of a motorcycle or tractor battery (PAP-00432454). Concentrations of lead in soil were as high as 2,160 mg/kg (PAP-00086279-296).

Leaded gasoline was stored at the Newark Terminal, based on the table of hazardous materials provided in the PA/SIR (PAP-00084086-90).

No additional information regarding the presence or use of lead at the Newark Terminal could be located in the available file materials.

Mercury

Concentrations of mercury in soil were as high as 2.3 mg/kg (PAP-00086279-296). No additional information regarding the presence or use of mercury at the Newark Terminal could be located in the available file materials.

Historic Fill

The Allocation Team has determined that the property is located on regional Historic Fill as designated by the NJDEP.¹

¹ *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, <https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm>, Quadrangle No. 52 and No. 53 (NJDEP map identifying locations of recognized historic fill).

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The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.² Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.³ PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.⁴

The levels of PCBs, PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00066714-15, 66; PAP-00086279-296; PAP-00086279-296).

COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	2,160 mg/kg
Copper	2,030 mg/kg
Mercury	2.3 mg/kg
Benzo(a)anthracene	12 mg/kg
Benzo(a)pyrene	19 mg/kg
Benzo(b)fluoranthene	23 mg/kg
Benzo(k)fluoranthene	26 mg/kg
Dibenzo(a,h)anthracene	10 mg/kg
Indeno(1,2,3-cd)pyrene	2.8 mg/kg
Total PCBs	67 mg/kg

* Metals data taken from the data tables in the *Remedial Investigation Report, Former Getty Terminal 56230, 86 Doremus Avenue*, dated April 2016 (PAP-00086279-96); PAHs data taken from Table 3 in the Remedial Investigation Report, Former Getty Newark Terminal – Area A, 86 Doremus Avenue, dated July 2014 (the Area A RIR) (PAP-00066716-18); PCBs data taken from Table 2 of the Area A RIR (PAP-00066714-15).

² *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

³ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

⁴ NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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According to the affidavit of Dale Holden, a former employee of Getty Petroleum Corporation, Historic Fill at the Newark Terminal was not disturbed, with the exception of the removal of USTs. Any Historic Fill excavated as part of the UST removals was properly handled and disposed of off-site, and was replaced with clean fill (PAP-00432454).

According to the Area A RIR, the presence of Historic Fill in Area A has been confirmed based on multiple lines of evidence including characterization of soil borings completed at the property, aerial photograph review, NJDEP Historic Fill maps, and the results of soil sampling that has confirmed the presence of PAHs and metals often associated with Historic Fill (PAP-00066685). Historic Fill is approximately two to ten feet deep in Area A. The Historic Fill was placed periodically between the early 1900s to the early 1970s (PAP-00066678).

According to the *LNAPL Interim Remedial Measures Report, Former Getty Terminal 56230*, dated December 2013, the entire Newark Terminal is within an area of Historic Fill, as mapped by NJDEP. Fill material was typically observed from the surface to approximately five to eight feet below ground surface (bgs) (PAP-00083961). The PA/SIR states that an evaluation of Historic Fill was conducted in the East and West Yard in November 2006 by Conestoga-Rovers & Associates (CRA) on behalf of Chevron. CRA concluded, based on soil analytical data, boring logs, historic fill maps, and correspondence with NJDEP, that Historic Fill was present throughout the full extent of the East and West Yards. CRA also concluded that PAHs and lead in soil were indicative of Historic Fill (PAP-00084092).

The *Remedial Investigation Report, Former Getty Terminal 56230, 86 Doremus Avenue*, dated April 2016, identified four metals and eight PAHs that were determined to be related to Historic Fill based on statistical analysis, including: arsenic, beryllium, lead, vanadium, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, dibenz(a,h)anthracene, and ideno(1,2,3-cd)pyrene (PAP-00086186).

5. COC Pathways

The Newark Terminal is located on the west bank of the Passaic River. The East Yard is bounded to the east by the Passaic River (PAP-00083019; PAP-00083962). The Passaic River is located approximately 580 feet east of the West Yard (PAP-00082725; PAP-00083310). Area A is covered with vegetation, which according to the Area A RIR, mitigates the risk of potential erosion of PCB, PAH, and lead-impacted surface soil (i.e., Historic Fill) and transport via surface water runoff. No permanent surface water bodies exist on the property. The Passaic River is located approximately 1,000 feet east of Area A (PAP-00066697).

According to the PA/SIR, the entire Newark Terminal, as well as other properties along Doremus Avenue, are subject to flooding during significant storm events. The entire Newark Terminal and surrounding areas were flooded during an October 2012 storm (PAP-00084094). During flooding events, regional contamination from the Passaic

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River, other industrial sites in the area, and regional Historic Fill are comingled with potential site-related impacts from the Newark Terminal AOCs (PAP-00084099).

Sanitary and Storm Sewer

Stormwater in the East Yard was collected in storm drains that led to an oil/water separator that discharged to the Passaic River, and was regulated pursuant to New Jersey Pollutant Discharge Elimination System Permit No. NJ0026034. Monitoring requirements pursuant to the NJPDES Permit included quarterly stormwater sampling, analysis, and reporting on Discharge Monitoring Reports (DMRs) (PAP-00432454).

The PA/SIR states that no storm sewer drains were observed in the West Yard (PAP-00084115).

Sanitary waste at the Newark Terminal was discharged to the PVSC system (PAP-00432454). Both the city water lines and the sanitary sewer lines are located on Doremus Avenue (PAP-00083311).

According to the PA/SIR, multiple storm drains and trench drains were identified within the loading rack area in the East Yard. These drains eventually connect to the oil/water separator that discharged to the Passaic River. The loading rack area is paved with concrete (PAP-00084096). The oil/water separator flooded in October 2012 and the area around the separator is frequently flooded by the Passaic River (PAP-00084105).

The PA/SIR also stated that the automotive repair shop in the West Yard includes eight floor drains, but the integrity of the drain piping and the final drainage point of these floor drains have not been determined. Some of the floor drains were filled with debris and the floor of the shop was heavily stained and greasy (PAP-00084115).

According to the PA/SIR, there were two slop sinks located in the automotive repair shop of the West Yard. There was also a slop sink in a closet in the locker room/dispatch office building. All three slop sinks had slight staining and are believed to be connected to the municipal sewer system (PAP-00084120).

Although plans of the drainage systems in the West Yard (PAP-00717684; dated 1983) and East Yard (PAP-00717679; dated 1984) show a connection between the yards under Doremus Avenue, an affidavit from former employee Mr. Dale Holden states that the connection was never installed (PAP-00717677). In addition, in 1994, a tracer dye test was performed by Tyree Organization, Ltd. The tracer study concluded that the final discharge point for the West Yard trench drain system and the Vehicle Repair Garage floor drain system was the City of Newark sanitary sewer system and not the East Yard oil/water separator (PAP-00717681).⁵

Direct Release

⁵ This Report was revised to include documents received on June 5, 2020. The additional documents did not change Leemilt's Petroleum Inc.'s previous certification.

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According to the PA/SIR, stormwater at the Newark Terminal was regulated pursuant to New Jersey Pollutant Discharge Elimination System (NJPDES) Permit No. NJ0026034, which applies specifically to an oil/water separator located in the East Yard adjacent to the Passaic River. This oil/water separator discharges directly to the river (PAP-00084091). No additional information regarding direct releases to the Passaic River at the Newark Terminal could be located in the available file materials.

Spills

The PA/SIR identified several NJDEP case numbers including:

- case No. 97-2-21-1337-13 (associated with AOC 10);
- case No. 97-2-21-1736-56 (associated with AOC 17);
- case No. 03-05-16-1549-38 (associated with AOC 1);
- case No. 04-02-13-0606-39 (associated with AOC 13);
- case No. 04-02-13-0619-23 (associated with AOC 13);
- case No. 05-02-23-1219-45 (associated with AOC 2 and AOC 20);
- case No. 06-02-10-1135-08 (associated with AOC 25);
- case No. 06-03-06-1407-55 (associated with AOC 1); and
- case No. 10-01-22-0348-17 (associated with AOC 14) (PAP-00084077, 91).

Case E20120316 is also identified in the RA/SIR (PAP-00084077). Case No. 03-05-16-1549-38 was determined to be an air release in the PA/SIR (PAP-00084095). The PA/SIR states that the incident associated with case No. 06-03-06-1407-55 appeared to be a simulated spill associated with a containment drill based on the description, but also states that it cannot be determined if an actual discharge occurred based on the available documentation (PAP-00084094). Similarly, the PA/SIR states that the incident associated with case No. 05-02-23-1219-45 appeared to be a simulated spill associated with a containment drill based on the description, but also states that it cannot be determined if an actual discharge occurred based on the available documentation (PAP-00084095). The case numbers associated with AOCs 13 and 14 appear to be related to unleaded gasoline releases and are unlikely to have contained OU2 COCs (PAP-00084101-102). The case number associated with AOC 25 appears to be related to a leaded gasoline release (PAP-00084106). It is unclear if the remaining case numbers are associated with OU2 COCs based on the available file materials.

A list of the 70 AOCs (not all of which are spills) identified at the Newark Terminal, including those associated with the case numbers listed above, is provided in Section 7 below.

6. Regulatory History/Enforcement Actions

Inspections and Violations

According to the PA/SIR, approximately 1,500 cubic yards of soil and debris were illegally placed in two piles at Area A in 1996. In addition to soil, the identified piles included tires, wood, concrete, metal, and other debris. The material was removed for

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off-site disposal (PAP-00084093). It is unclear if the piles of soil and debris contained OU2 COCs based on the available file materials.

Permits

Stormwater at the Newark Terminal was regulated pursuant to NJPDES Permit No. NJ0026034 (PAP-00066869).

According to the PA/SIR, the permits noted above apply specifically to an oil/water separator located in the East Yard adjacent to the Passaic River, which discharges directly to the river (PAP-00084091).

7. Response Actions

Characterization Activities

The following is a list of major response action documents identified in the available file material:

- *LNAPL Interim Remedial Measures Report, Former Getty Terminal 56230*, dated September 2017 (PAP-00086766);
- *Remedial Investigation Report, Former Getty Terminal 56230, 86 Doremus Avenue*, dated April 2016 (PAP-00086165);
- *Remedial Investigation Report, Former Getty Newark Terminal – Area A, 86 Doremus Avenue*, dated July 2014 (Area A RIR) (PAP-00066671);
- *Preliminary Assessment/Site Investigation Report, Former Getty Terminal 56230*, dated March 2014 (PA/SIR) (PAP-00084072);
- *LNAPL Interim Remedial Measures Report, Former Getty Terminal 56230*, dated December 2013 (PAP-00083957);
- *LNAPL Free Product Interim Remedial Measures Report, Getty Terminal No. 56230 (West Yard)*, dated May 27, 2011 (PAP-00083305);
- *Remedial Action Work Plan*, dated January 23, 2008 (PAP-00066671);
- *Underground Storage Tank Remedial Investigation Report, Getty No. 56230 – Newark Terminal*, dated April 7, 2006 (UST RIR) (PAP-00083013);
- *Baseline Ecological Evaluation Report*, dated February 23, 2006 (PAP-00066799);
- *Remedial Investigation Sampling Results for Area A*, dated March 31, 2005 (PAP-00066676);
- *Remedial Investigation Report, Getty Terminal No. 56230 (West Yard)*, dated June 16, 2004 (PAP-00082888);
- *Underground Storage Tank Site Investigation Report, Getty Terminal No. 56230 (West Yard)*, dated February 28, 2003 (West Yard UST SIR) (PAP-00082720);
- *Remedial Action Report for PCB Soils in Area A, Volume I Report, Getty Newark Terminal*, dated July 25, 1997 (PAP-00066760, PAS-00005678); and
- *Area A Closure Report, Newark Terminal, Newark New Jersey, ECRA Case No. 84455*, dated November 1991 (PAP-00066737).

Sewer

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According to the PA/SIR, the loading rack drains and associated manholes were inspected in 1997. Soil and debris underneath the steel grating were manually removed and a high pressure water jet was used to flush the remaining sediment from the pipes into the collection system, which discharges to the oil/water separator. Following the cleaning activities, the drains were visually inspected and found to be constructed of concrete and lined with steel sheeting. The integrity of the collected drains was intact (PAP-00084096). The site visits conducted during the preliminary assessment/site investigation found that several of the loading rack drains were blocked with debris and were not functioning (PAP-00084097, 116).

The PA/SIR states that four sumps are located in the East Yard: one associated with the vapor recovery unit for Tank No. 5 and three associated with the fire protection or sewer systems, including a sump on the west side of the locker room/dispatch office building, a sump on the west side of the foam building, and a sump inside the northern office building. Black stains were visible near the bottom of the sump adjacent to the locker room/dispatch office building. There is one sump located in the West Yard, northeast of the foam building. Water in this sump had a sheen which may have been due to surface runoff from the adjacent loading area and heavy rain during the inspection (PAP-00084116).

Soil

Soil sampling was conducted at the East Yard and West Yard on behalf of Getty Petroleum Corporation between April 2013 and April 2014, specifically focusing on 12 of the 70 AOCs identified at the Newark Terminal (PAP-00086183).

Remedial Activities

According to the PA/SIR, there were two Industrial Site Recovery Act (ISRA) cases: E84455 related to the sale of the Newark Terminal to PTRC by Texaco Inc. in 1984 and E20120316 related to the cessation of operations by the bankruptcy of the operator, GPML, in 2012 (PAP-00084077). Various remedial activities related to these two cases are presented below.

Implemented by Texaco/Chevron

According to the PA/SIR, two 2,000-gallon diesel USTs identified as Tanks G-1 and G-2 were removed from the East Yard of the Newark Terminal on January 29, 1986. The USTs were located to the north of the locker room/dispatch office building. Tank G-1 had previously been abandoned and filled with sand. During excavation of Tank G-1, a second sand-filled tank (Tank G-2) was found beneath the HVAC system pad. Piping was found on three sides of the excavation, but all piping appeared to be abandoned. Both USTs, associated piping, and stained soil were removed to a depth of 8-10 feet. The USTs were both observed to be corroded around the seams. Correspondence from NJDEP stated that they had no registration or records of the installation or removal of these USTs (PAP-00084108).

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The PA/SIR states that a 2,000-gallon UST and a 1,500-gallon UST identified as Tanks H-1 and H-2 were removed from the East Yard of the Newark Terminal on January 29, 1986. The USTs were located to the west of the locker room/dispatch office building. The former contents of these USTs were not identified. Tank H-1 had previously been abandoned and filled with sand. During excavation of Tank H-1, a second sand-filled tank (Tank H-2) was found. Tank H-2 was strapped into an open-bottomed concrete-walled vault. The USTs were both observed to be corroded around the seams. Both the USTs and stained soil were removed to a depth of 6-8 feet. A vacuum truck was used to remove oily water from the excavation. Correspondence from NJDEP stated that they had no registration or records of the installation or removal of these USTs (PAP-00084108-109).

The PA/SIR states that a 2,000-gallon No. 2 fuel oil UST identified as Tank E, located south of the southern office building, was removed from the East Yard on January 30, 1986. Prior to removal, the tank was reported as a 1,000-gallon UST, but during removal it was discovered to be a 2,000-gallon UST. The tank appeared to be previously abandoned and had been filled with sand. Stained soil was removed to 8 feet bgs and the excavation was backfilled with sand. Correspondence from NJDEP stated that they had no registration or records of the installation or removal of this UST (PAP-00084107).

According to the PA/SIR, contractors attempted to remove a 4,000-gallon fuel oil UST identified as Tank N from the West Yard between January 31 and February 3, 1986. Prior to removal, the tank was reported as a 2,000-gallon UST, but during removal it was discovered to be a 4,000-gallon UST. Tank N had previously been abandoned and filled with sand. Tank N was located near footings that support overhead piping and could not be removed. Correspondence from NJDEP stated that they had no registration or records of the installation or removal of this UST (PAP-00084111);

The PA/SIR states that a 1,000-gallon waste oil UST identified as Tank I, located west of the automotive repair shop, was removed from the Newark Terminal on February 3-4, 1986. Prior to removal, the tank was reported as a 100-gallon waste oil UST, but during removal it was discovered to be a 1,000-gallon UST located inside an open bottomed concrete-walled vault. Water with an oil layer was present inside the UST prior to removal. Following tank removal, soil within the vault was removed to a depth of 6-8 feet and a new 550-gallon fiberglass tank was installed within the vault. The replacement 550-gallon waste oil UST was removed on February 21, 1997 under closure number No. C96-1146. The UST contained no holes, but stained soils and a sheen were noted during tank removal. NJDEP assigned case number No. 97-2-21-1337-13. Post-excavation samples were analyzed for total petroleum hydrocarbons (TPHC) (PAP-00084099).

According to the Area A RIR, remedial investigation and reporting activities in Area A of the Newark Terminal occurred between May 1988 and March 2005 (PAP-00066676). In 1988, eleven soil borings (SB-1 through SB-11) were advanced to groundwater within Area A to investigate and characterize the soil and a total of 35 soil samples were submitted for analysis of TPHC and lead (PAP-00066679). Total lead concentrations ranged from 1.3 mg/kg to 8,200 mg/kg (PAP-00066680).

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The Area A RIR, states that in May 1990 soil containing TPHC and lead was delineated and excavated to the approved cleanup levels (500 ppm for TPHC; 1,000 ppm for lead; 1 ppm for volatile organic compounds (VOCs); and 10 ppm for Base Neutrals). PCBs were found during waste classification sampling, requiring another phase of investigation. Area A Phase II Investigation activities were performed in November 1990 to further delineate and investigate PCBs, TPHC, lead, BNs, and VOCs. Soil with levels of TPHC, PCBs, and BNs exceeding cleanup levels was excavated. The ECRA cleanup guideline of 5 ppm was used for PCBs. Post-excavation samples were collected in January 1991 and some sample results for PCBs and TPHC exceeded the cleanup levels (PAP-0006680).

The Area A RIR also summarizes the Phase III investigation activities that were performed from May 1991 through September 1991, as well as a final soil excavation. Approximately 4,000 tons of soil were excavated from Area A during Phases II and III (PAP-0006681). In a letter dated June 12, 1992, the NJDEP declined the request for a No Further Action (NFA) determination because post-excavation sampling was not deemed sufficient (PAP-0006681, 754-758).

According to the Area A RIR, Phase IV investigation activities were performed at Area A in March 1993, which found that PCBs were detected at various locations within Area A at concentrations exceeding the Non-Residential Direct Contact Soil Cleanup Criteria (DCSCC) (PAP-0006681).

According to the Area A RIR, further investigation of soil was conducted between December 1994 and January 1995. A total of 36 samples were collected to delineate PCBs and 25 samples were collected to delineate PAHs. Six samples were also collected off-site, to the southwest of Area A. Results showed that the most elevated PCB concentrations (10 to 67 ppm) existed in soil along the southwestern property boundary and in off-site sampling locations (PAP-0006681-82).

Results also showed that PAHs were detected throughout Area A soils. Investigative activities for Area A also included review of aerial photographs from the 1947, 1959, 1963, 1969, 1973, and 1982, which provided evidence of historic fill placement. Areas observed to undergo the most disturbances in Area A correspond to areas of highest PCB concentrations. In a letter dated December 6, 1996, the NJDEP accepted the evidence of historic fill (PAP-0006681-82).

In 1996, Area A was divided into Areas 1 through 4 to facilitate addition delineation of soil contamination. Following delineation efforts, 229 tons of soil were excavated from Area A to remove PCBs above 20 mg/kg (PAP-0006682).

In February 2004, additional sampling efforts were conducted which included the installation and sampling of eleven soil borings along the perimeter of Area A and four borings within Area A. Surface soil samples were also collected at six locations (PAP-0006686-87).

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According to the PA/SIR, Chevron proposed a deed notice and cap for Area A in August 2013 (PAP-00084100).

Implemented by GPMI

According to the PA/SIR, a steel 1,000-gallon No. 2 fuel oil UST identified as Tank 7 was removed from the East Yard on February 21, 1997. The tank closure was associated with approval No. C96-1146. During tank removal, groundwater with a sheen was encountered at 2-3 feet bgs and NJDEP assigned case number No. 97-2-21-1736-56. Post-excavation samples showed that soil was impacted with TPHC at concentrations ranging from 26,500 to 39,000 mg/kg (PAP-00084104).

According to the West Yard UST SIR, a 1,000-gallon unleaded gasoline UST (Registration No. 004475) identified as Tank 6 was closed at the West Yard. Closure activities were completed on January 13, 2003, under closure number No. N02-1799 (PAP-00082725-26; PAP-00084103). Prior to excavation work, approximately 1,688 gallons of water and unleaded gasoline were removed from the UST and transported off-site for disposal via vacuum truck (PAP-00082726). The removal of 1,688 gallons of water and gasoline implied that the UST may have leaked (PAP-00084103). The UST was removed and transported for scrap recycling. No associated piping was uncovered during tank removal. No holes or corrosion were observed upon inspection of the tank. There were no visual observations of impacted soils within the excavation. Six post-excavation samples were collected from the sidewalls and analyzed for total VOCs. No exceedances of NJDEP soil criteria were detected. The excavation was then backfilled with pea gravel (PAP-00082727-28).

According to the UST RIR, a 2,000-gallon fiberglass gasoline UST (Registration No. 004475) was closed at the East Yard and closure activities were completed on February 2, 2006 (PAP-00083018, 20). Approximately 625 gallons of liquid were removed from the UST via vacuum truck. Due to the presence of product lines and utility lines, the UST was removed from the excavation in pieces. Subsurface soils were impacted, as demonstrated by petroleum odors, stained soils, and elevation PID readings ranging from 80 to 2,400 ppm. No associated piping was uncovered during tank removal. Fifty tons of soil were removed and disposed offsite during UST removal activities (PAP-00083020-21). Four post-excavation samples were collected from the sidewalls and analyzed for total VOCs, and benzene was detected above the NJDEP soil criteria of 1 mg/kg in three of the four samples. The excavation was backfilled with clean fill (PAP-00083022-23). Table 2 shows that samples were also analyzed for lead and concentrations ranged from 18.2 to 50.4 mg/kg (PAP-00083030).

Implemented by Getty Properties Corp

According to the PA/SIR, there was an initial list of 70 AOCs identified at the Newark Terminal, 53 of which require additional investigation or remediation. A list of AOCs is presented below (PAP-00084078-80):

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- AOC 1: Vapor Recovery Unit in Tank #5 Basin
- AOC 2: 8,000-Gallon Fuel Additive AST and Tank Pump (Tank #1/#3 Basin)
- AOC 3: Pump and Bleeder Valves Staining (North of Tanks #1-#4)
- AOC 4: Loading Rack Drainage System
- AOC 5: West Yard Valve Units by Southeast Wall of Tank #11 Basin
- AOC 6: 10,000-Gallon Diesel AST in Tank #11 Basin
- AOC 7: Sandblasting Grit (Tank #8 and #9)
- AOC 8: Closure of Well MW-10

- AOC 9: River Mass Loading Assessment
- AOC 10: Auto Repair Shop Former 1,000-Gallon Waste Oil UST (UST I) and 550-Gallon Waste Oil UST (Tank E2)
- AOC 11: Area A (Chevron)
- AOC 12: West Yard Free Product in MW-18 Area
- AOC 13: 2004 Gasoline Spill
- AOC 14: Tank #11 Gasoline Spill
- AOC 15: East Yard Free Product in MW-12 Area
- AOC 16: West Yard Former 1,000-Gallon Unleaded Gasoline UST (Tank 6)

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- AOC 17: Northern Office Former 1,000-Gallon No. 2 Fuel Oil UST (Tank 7)
- AOC 18: Regional Site-Wide Ground Water
- AOC 19: Oil/Water Separator
- AOC 20: 3,000-Gallon Fuel Additive AST (Tank #2/#4 Basin)
- AOC 21: East Yard Garage 275-Gallon Fuel Oil AST
- AOC 22: East Yard Northern Office 600-Gallon Fuel Oil AST
- AOC 23: East and West Yard 1,000-Gallon and 1,500-Gallon Foam ASTs

- AOC 24: East Yard Garage Tank A (Potential UST)
- AOC 25: Former 2,000-Gallon Leaded Gasoline UST (Tank E1)
- AOC 26: 2,000-Gallon Unleaded Gasoline Sump (Tank E5)
- AOC 27: East Yard Southern Office Former 2,000-Gallon No. 2 Fuel Oil UST (UST E)
- AOC 28: UST F
- AOC 29: Dispatch Office/Locker Room Former Two 2,000-Gallon Diesel USTs (UST G-1 & G-2)
- AOC 30: East Yard Former 1,500-Gallon UST and 2,000-Gallon UST (UST H-1 & H-2)
- AOC 31: Auto Repair Shop 4,000-Gallon No. 2 Fuel Oil UST (UST J)
- AOC 32: West Yard Warehouse 4,000-Gallon No. 2 Fuel Oil UST (UST K)
- AOC 33: East Yard 2,000-Gallon Dropout UST (UST L)
- AOC 34: West Yard 2,000-Gallon Dropout UST (UST M)
- AOC 35: Auto Repair Shop Abandoned 4,000-Gallon No. 1 Fuel Oil UST (UST N)
- AOC 36: West Yard Fuel Loading Area
- AOC 37: Warehouse Loading Docks
- AOC 38: Garage Loading Dock
- AOC 39: Dumpsters and Shipping Container
- AOC 40: Chemical Storage Cabinets
- AOC 41: Garage Material Storage
- AOC 42: Locker Room/Dispatch Office Electrical Room Material Storage
- AOC 43: Auto Repair Shop Material Storage

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- AOC 44: Warehouse Material Storage
- AOC 45: West Yard Former Drum Storage Area
- AOC 46: Auto Repair Shop Floor Drains
- AOC 47: Locker Room Floor Drain
- AOC 48: Storm Sewer Collection System and Drains
- AOC 49: Fire and/or Sewer Sumps
- AOC 50: Roof Leaders
- AOC 51: Historic Fill
- AOC 52: Electrical Transformers
- AOC 53: Terminal Piping
- AOC 54: Open Pipes
- AOC 55: Compressor Vent Discharge
- AOC 56: East Yard Northern Office Fire Pump/Boiler Room
- AOC 57: Auto Repair Shop Boiler Room
- AOC 58: Slop Sinks
- AOC 59: Air Vents and Ducts
- AOC 60: West Yard - Northeast Side Adjacent to Doremus Avenue
- AOC 61: Potential Former Septic System
- AOC 62: Site Flooding
- AOC 63: Former Railroad Siding and Rail Cars
- AOC 64: Former West Yard Boiler House (1931)
- AOC 65: Former West Yard Chemical Storage (1931)
- AOC 66: Former Elevators (1931)
- AOC 67: Former Soap Manufacturing (1931) / East Yard Barrel Storage (1950)
- AOC 68: Former Lacquer Manufacturing (1931) / Motor Oil Warehouse (1950)
- AOC 69: Former Gasoline Pump Equipment Storage (~1950 - 1952)
- AOC 70: Former Oil Filling Area (1950 - 2003)

The locations of the AOCs are depicted on the two figures included above in Section 2, which show the features of the East Yard and West Yard, as well as the AOC numbers (numbers within the green circles) (PAP-00084131-132).

8. Summary of Asserted Defenses

Leemilt's asserts that while there are reports of petroleum releases and/or discharges at the Facility, these releases fall within CERCLA's petroleum exclusion, including any constituent PAH COCs. See Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9601(14).

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LEGACY VULCAN, LLC

Facility Name, Address and Size: Balbach Smelting and Refining Corporation Site/Vulcan Site/Kolker Site/Inland Chemical Corporation Site/McKesson EnviroSystems Site/Safety-Kleen EnviroSystems Site; 600 Doremus Avenue (also 504-508 Doremus Avenue), Newark, New Jersey 07105; 29 acres; 150 employees working seven days per week, three shifts per day (PAS-00010501).

1. **Business Type:** Production, distribution and sale of construction materials and industrial chemicals (PAS-00010515). Primary chemical manufacturing products included chlorine, caustic soda, chloromethane, methylene chloride, hydrochloric acid, bleach, chloroform, and plasticizers (PAP-00188319; PAP-00366038-39; PAP-00366830; PAS-00010506)

2. **Time Period of Ownership/Operations**

Operator: 1952-1975

Owner: 1952-1974

1952: According to a *Remedial Investigation Report*, prepared for Safety-Kleen EnviroSystems Company, dated August 1994, Vulcan's predecessor, Kolker Chemical Company (Kolker) (and/or Leon A. Kolker), owned the facility from approximately May 5, 1952, to approximately July 19, 1963, when Vulcan acquired Kolker (PAP-00188319-20). [It is noted that according to a November 4, 1991, Directive and Notice to Insurers Letter, prior to Vulcan's ownership, Kolker produced nonferrous inorganic salts from the 1920s until 1962. The document also states that in 1961, Vulcan purchased Kolker and dissolved Kolker in 1964 (PAS-00010336).

1962: Vulcan operated the site as a chemical production facility from 1962 until May 1975 (PAP-00188320).

1974: According to a January 14, 1976, letter from Vulcan Materials Company, Inland purchased certain assets of Vulcan, including a chlor-alkali plant and real property on May 1, 1974. This included agreements that Vulcan would continue operation of their chlor-alkali facilities and chloromethanes plants at the site in part using chlorine and other raw materials supplied by Inland (PAP-00186853; PAP-00186886-93; PAP-00188783-89; PAP-00187163-75).

1975: On or about May 1, 1975, Inland shut down operations of the chlor-alkali plant, and Vulcan terminated operation of the chloromethanes plant on or about May 15, 1975 (PAP-00186853).

1981: According to a September, 2001, *Documentation of Environmental Indicator Determination*, Inland and McKesson EnviroSystems Company (MEC) merged in 1981 (PAS-00091937).

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- 1982: On October 10, 1982, an explosion and fire destroyed much of the facility. The New Jersey Department of Environmental Protection (NJDEP) closed the site two days later (PAS-00091937).
- 1987: According to the *Certification of Virgil W. Duffie, III, Esq.*, in March 1987, the issued and outstanding shares of common stock of MEC were sold to Nucer, a former wholly owned subsidiary of Safety-Kleen Systems, Inc. Subsequent to March 31, 1987, Nucer and MEC merged into a new corporation named Safety-Kleen Envirosystems Company (PAS-00187236).
- 1998: In 1998, Safety-Kleen Systems, Inc. was acquired by, and became a wholly owned subsidiary of Laidlaw Environmental Services, Inc. At or about the same time, Laidlaw Environmental Services, Inc. changed its name to Safety-Kleen Corp. and renamed its newly acquired subsidiary Safety-Kleen Systems, Inc. (PAP-00187236).

3. Operational History/COC Use and Presence at the Facility

Kolker manufactured a number of organic and inorganic chemicals, including non-ferrous inorganic salts, chlorine, chloroform, methyl chloride, methylene chloride, and plasticizers (PAP-00188319; PAP-00366038-39; PAP-00366830). In addition, Kolker's use of PCBs at the facility is documented by sales records from Monsanto indicating they purchased at least 183,000 pounds of PCBs (including Aroclors 1242, 1248, 1254, and 1260) between 1958 and 1962 (PAP-00366041-53; PAP-00366040). It is noted that documentation of the use of PCBs at the facility was not identified in the available file material.

Vulcan acquired Kolker in 1963 and produced a variety of chemicals during its 13 years in operation at the site, including, but not limited to, chlorine, caustic soda, chloroform, methyl chloride, hydrochloric acid and methylene chloride, as noted in a November 4, 1991, Directive and Notice to Insurers Letter (PAS-00010337). As reported by a June 20, 1972, Waste Effluent Survey, chlorine and caustic soda were produced by the electrolysis of sodium chloride brine solution, in the chlor-alkali facility. In the chloromethanes facility methylene chloride was produced by the thermal chlorination of methyl chloride. Byproduct hydrogen chloride was reacted with methanol to produce methyl chloride (PAS-00010501).

According to a January 14, 1976, letter from Vulcan Materials Company, Inland purchased certain assets of Vulcan on May 1, 1974. This included agreements that Vulcan would continue operation of their chlor-alkali and chloromethanes plant at the site, in part using chlorine and other raw materials supplied by Inland until May 1975 (PAP-0186853; PAP-00186886; PAP-00188783; PAP-00187163).

According to a letter prepared by Inland, dated June 27, 1975, lead was generated as a result of the chlor-alkali process (PAP-00188223). An Inland memorandum, dated December 7, 1973, explains how lead was generated in this process. According to the memorandum, the tops of the anodes in which the chlorine was manufactured were cast from concrete. When a cell top was rebuilt, graphite anodes were bolted to a bus bar

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assembly in the cell top. The junction between the graphite and the bus bar assembly was fixed by pouring molten lead into the cell top. The lead was painted with asphalt to protect the lead from exposure to chlorine (PAP-00362239). This operation was shut down in May 1975 (PAP-00188218).

4. Identified COCs

- PCBs (used by Kolker)
- Copper (released by Balbach)
- Lead (released by Balbach, released by Vulcan, detected)
- Mercury (released by Balbach)

It is noted that, according to an Administrative Consent Order, dated June 23, 1993, the site constitutes a portion of a larger tract of land on which Balbach Smelting and Refining, Inc. (Balbach) conducted smelting and refining of lead, copper, and precious metal-based ores from at least the 1890s until 1938 (PAP-00186325-6). Balbach was reportedly one of the largest metals refiners in the world at the time (PAP-00186326), and according to a *Phase II Remedial Investigation Work Plan*, prepared by Blasland, Bouck, & Lee, Inc., dated March 1995, Balbach processed “substantial quantities” of ores and generated a variety of “toxic” heavy metals, resulting in lead, copper, and mercury contamination attributable to Balbach’s operations (PAS-00011253-4; PAP-00362426, 35-38). In addition, according to a *Phase II Remedial Investigation Report*, prepared by BBL, dated December 1995 (1995 Phase II RI), Balbach filled the site with smelter slag (PAP-00364135; PAP-00188312, 52-53; PAP-00186325-6; PAP-00362426, 36). In 1993, an Administrative Consent Order was issued by NJDEP which exempted Safety-Kleen Environsystems Company from responsibility for remedying conditions resulting from the former metal refining practices at the site, or from any other activities which pre-dated 1952 (PAS-00011257).

Further, according to the 1995 Phase II RI, metallic constituents detected in soil during Safety-Kleen Environsystems Company’s Phase I and Phase II remedial investigations were related to historical smelting operations conducted by Balbach, and were not related to post-1952 operations. This was confirmed by the results of statistical analyses performed on the Phase I RI soils data. The report states that the results of this statistical analysis were accepted by NJDEP in a May 3, 1995, Phase II RI Work Plan conditional approval letter (PAP-00364123; PAS-00010852-3).

PCBs

Kolker’s use of PCBs at the facility is documented by sales records from Monsanto indicating they purchased at least 183,000 pounds of PCBs (including Aroclors 1242, 1248, 1254, and 1260) between 1958 and 1962 (PAP-00366041-53; PAP-00366040). It is noted that documentation of the use of PCBs at the facility was not identified in the available file material.

No sampling data were available from the time period during which Vulcan operated at the site.

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Lead

According to a letter prepared by Inland, dated June 27, 1975, lead was generated as a result of the chlor-alkali process (PAP-00188223). Vulcan issued a report on November 29, 1972, titled *Vulcan Materials Company Newark, New Jersey Plant* that detailed a number of environmental concerns at the site, including the presence of "high levels" of contaminants in the plant effluent which discharged to the Newark Bay. Samples collected from the effluent from July 11, 1972, to July 22, 1972, show the water to be contaminated with lead (10 pounds per day), among other contaminants (PAS-00010465). The report also discussed the installation of a "spillage collection system" to reduce caustic losses from equipment malfunctions, operator errors and weekly equipment washouts (PAS-00010337).

According to the *Vulcan Materials Company Newark, New Jersey Plant* dated November 29, 1972, the calculated quantity of lead added to the plant effluent as a result of process operations was 10 pounds per day (PAS-00010465). Vulcan reported that they did not know of any feasible method for a significant reduction in lead, and that the lead concentration in the total plant effluent and in the chlorine-caustic unit effluent was 0.1 to 0.3 parts per million (ppm). The methylene chloride unit effluent contained about 1 ppm lead, while the cathode wash water contained lead at 0.1 to 14 ppm. Vulcan stated that part of the lead could be removed from the latter two streams, but that they contained only 10 to 15 percent of the average of 10 pounds per day discharged in the effluent. They went on to state that only a 10 percent reduction of lead was practical, and that this would be achieved by the fourth quarter of 1973 (PAS-00010469).

The following lead data were available from 1973 and 1974:

- In April 1973, the concentrations of lead in plant effluent ranged from 0.015 ppm to 0.076 ppm (PAP-00217718).
- In October 1973, the concentrations of lead in plant effluent ranged from 0.003 ppm to 0.090 ppm (PAP-00219175).
- In November 1973, the concentrations of lead in plant effluent ranged from 0.001 ppm to 0.009 ppm (PAP-00219176).
- In March 1974, after Vulcan's outside lab began using a new sample preparation methodology, the concentrations of lead in plant effluent ranged from 0.16 ppm to 0.45 ppm; net pounds per day ranged from 4 to 28 net pounds per day (PAP-00219181).
- In April 1974, the concentrations of lead in plant effluent ranged from 0.14 ppm to 0.65 ppm; net pounds per day ranged from 4 to 48 net pounds per day (PAP-00188992).
- In June 1974, the concentrations of lead in plant effluent ranged from 0.004 ppm to 0.3 ppm and 0.06 to 20 net pounds per day (PAP-00219184).

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It is noted that Vulcan's monthly discharge monitoring results from January 1974 through April 1974 describe that the independent laboratory used by Vulcan to analyze its wastewater samples changed its method of sample preparation resulting in increases in reported lead discharges (PAP-00188996; PAP-0185401; PAP-00185411; PAP-00188992).

According to the *Expert Report of Michael Werth*, prepared for McKesson Corporation, dated April 2019, the mass of lead discharged to Newark Bay from the site via Outfall 001 during Vulcan's operations was approximately 6,600 pounds. An estimated 820 pounds of lead were discharged by Inland in excess of permit limits (PAP-00402571-573, 583, 595-602).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.¹

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.² Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.³ PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.⁴

It is noted that according to a memo prepared by NJDEP, dated December 14, 1979, three soil borings show compacted fill and cinder from 0 to 10 feet (PAP-00187208). According to a *Remedial Investigation Report*, prepared for Safety-Kleen Envirosystems Company, dated August 1994, the entire site is covered with fill which dates back to before 1911 (PAP-00188312). In addition, according to a *Phase II Remedial Investigation Work Plan*, dated March 1995, surface soil extending to 7 to 10 feet is composed of fill material of variable composition (PAP-00362435). Finally, according to the 1995 Phase II RI, metallic constituents detected in soil during Safety-Kleen Envirosystems Company's Phase I and Phase II remedial investigations were related to

¹ *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, <https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm>, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

² *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

³ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

⁴ NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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historical smelting operations conducted by Balbach, and were not related to post-1952 operations. This was confirmed by the results of statistical analyses performed on the Phase I RI soils data. The report states that the results of this statistical analysis were accepted by NJDEP in a May 3, 1995, Phase II RI Work Plan conditional approval letter (PAP-00364123; PAS-00010852-53).

No sampling data were available from the time period during which Vulcan operated at the site.

5. COC Pathways

The facility is located at the mouth of the Passaic River where it enters Newark Bay (just north of River Mile 0.0) (PAP-00402573, 76).

Sanitary and Storm Sewer

As reported by a June 20, 1972, Waste Effluent Survey, Vulcan was not connected to the Passaic Valley Sewerage Commission (PVSC) system; sanitary wastes were disposed in septic tanks (PAS-00010503).

Direct Release

According to a *Vulcan Materials Company Chemicals Division* report, dated March 4, 1969, water drawn from Newark Bay was used by the facility for cooling, barometric condensers, and "other" condensers and then returned to Newark Bay (PAS-00058035). The report goes on to state that pollutants could enter effluent at the barometric condensers or through accidental spills or leaks in the system (PAS-00058037). This would have included the lead contaminated effluent discussed in Sections 4 and 5 above.

As reported by a June 20, 1972, Waste Effluent Survey, Vulcan discharged 5,387,000,000 gallons of wastewater to Newark Bay (PAS-00010502). The facility also reported in the 1972 Waste Effluent Survey that they were not connected to the PVSC system; sanitary wastes were disposed in septic tanks (PAS-00010503).

According to a letter prepared by Vulcan, dated April 26, 1972, the only facility discharge point was a main plant drain discharging into Newark Bay (PAS-00010499).

According to a National Pollutant Discharge Elimination System (NPDES) Application dated September 27, 1976, the facility held a NPDES permit (#NJ0001279) at least as early as December 30, 1972. The application states the facility had one discharge point to a surface water body via outfall 001; the receiving water body was listed as "Tidal Waters #3; Newark." The discharge volume was listed as 10,000 gallons per day (PAP-00185803-07).

According to a memo prepared by Inland, dated June 3, 1974, a flooding condition due to heavy rains was documented by Vulcan, and consisted of a drainage ditch overflowing across plant property, picking up contaminants from the soil. A pump was

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installed to transfer surplus water in the ditch back into the plant water disposal system (PAP-00188969).

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

According to a *Vulcan Materials Company Chemicals Division* report, dated March 4, 1969, "some discoloration" at the point of wastewater discharge to Newark Bay was observed during an inspection on March 4, 1969 (PAS-00058036).

Enforcement Actions

According to a *Report on the Quality of the Interstate Waters of the Lower Passaic River and Upper and Lower Bays of New York Harbor*, dated November 1969, the New Jersey State Department of Health had issued "pollution abatement orders" to Vulcan (PAS-00058707). Details of the reason for the order are not provided in the report. According to a letter prepared by legal counsel for Vulcan, dated November 5, 1969, Vulcan was given notice to install and provide wastewater treatment and disposal facilities, and to cease discharging "industrial waste or polluting matter" into the Passaic River (PAP-00217398). There is no indication that COCs were associated with the referenced discharge. According to the letter, Vulcan was in the process of addressing the order. It also states that water was taken into the plant from Newark Bay at a point north of the "main sewer," which was used for cooling purposes, and "it picks up a minimal amount of waste which will be the subject of intensive treatment and control" (PAP-00217398-404).

NJDEPE issued a Directive and Notice to Insurer, dated October 31, 1991, to Vulcan directing Vulcan to pay NJDEPE for the completion of a remedial investigation and feasibility study of the site (PAS-00010336-38).

Permits

As reported by a September 27, 1976, NPDES Application, the facility held a NPDES permit (#NJ0001279) as early as December 30, 1972 (PAP-00185805).

7. Response Actions

There is no information regarding sampling data during which Vulcan operated in the available file material.

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

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NATIONAL-STANDARD COMPANY

Facility Name, Address and Size: National-Standard Company – Athenia Steel Site; 714-716 Clifton Avenue, Clifton, New Jersey; 35 acres (PAP-00382569); Information on number of employees and shifts per day was not identified in available file material.

1. Business Type: Rolling and heat-treating of flat spring steel (PAP-00382575)

2. Time Period of Ownership/Operations

Operator: 1938 to 1988

Owner: 1938 to 1999

1907: National-Standard Company (National Standard) was founded in Chicago, Illinois, in 1907. At the same time, Athenia Steel Company began its operations at 714-716 Clifton Avenue, Clifton, New Jersey (PAS-00012920).

1938: National Standard acquired the site from Athenia Steel Company in 1938 (PAP-00090916).

1988: Operations at the Clifton Avenue site were terminated in 1988 (PAP-00090916; PAP-00091040).

1999: National Standard sold the property to the City of Clifton in September 1999 (PAP-00197478).

3. Operational History/COC Use and Presence at the Facility

According to a *Decommissioning and Demolition Report*, dated September 25, 1989 (1989 D&D Report), operations at the site included the production of various flat wire and strip steel products, including high carbon steel wire and strips from hot rolled steel bands and strips (PAP-00090960, 62). Acid baths were utilized to clean steel stock and the finished product was coated with petroleum oil to retard oxidation (PAP-00090990). Molten lead was historically used to heat and soften steel stock (PAP-00090925). Site studies commissioned by National Standard reported that drawing, cutting, heat treating, cleaning, and other site operations required the use of, or resulted in the generation of, the following materials of note:

- Gasoline (leaded and unleaded);
- Lead (elemental lead);
- Lubricating oils;
- Mineral spirits;
- No. 2 fuel oil;
- No. 4 fuel oil;
- Preservative oils;
- Waste oil and water; and,
- Water soluble oil (PAP-00090962, 66, 70, 72).

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According to the 1989 D&D Report, on-site heat and hot water were historically produced via the burning of coal. By the mid- to-late 1960s, No. 2 fuel oil, natural gas, and propane were substituted for coal as a source for heat and hot water production (PAP-00090962, 85). According to an *ECRA Cleanup Plan Report*, dated August 21, 1989 (1989 ECRA), a former coal gasification plant was also located on the site. The coal gasification plant was used to convert coal into "usable gas product" and to supplement energy needs for daily manufacturing operations. The specific time-period that the coal gasification plant operated is not reported (PAP-00197095; PAP-00090985).

The 1989 ECRA states that there were two landfill areas present on the site that received site generated production waste materials, and off-site soils, asphalt, and concrete debris, until this practice was discontinued in the mid-1970s. Ash and cinders from the operation of the on-site power house and coal gasification plant were present within the landfill areas and beneath portions of the main plant buildings (PAP-00197095). According to a *Disruption and Closure Permit Application*, dated June 1, 1989, lead dross (scum from the surface of the molten lead) and soils with elemental lead associated with operations at the site also were placed in the landfill; however, investigations, including borings and test pits, did not reveal lead dross in the landfill (PAP-00197231). It was estimated that a total of 170,000 cubic yards of miscellaneous debris was present within the landfilled areas (PAP-00197232).

According to a *Report of Findings, Phase I Sampling and Analysis for National Standard*, dated March 29, 1988 (1988 Phase I Report), site rinse water from the manufacturing lines was originally discharged to at least three, and possibly five, cesspools or dry wells until the 1970s when the discharges were connected (after pre-treatment) to the Passaic Valley Sewerage Commission (PVSC) system (PAP-00196946; PAP-00090922; PAS-00101870).

Based on review of available file material, it is unclear what OU2 COCs may have been in the rinse water, if any; however, copper, lead, and mercury were identified in soil when the bottoms of the cesspools/dry wells were sampled. This is discussed further in Section 4 below. According to the 1989 *ECRA*, there were three on-site cesspools, which reportedly received rinse waters from the manufacturing lines from the early 1900s to approximately 1973. The cesspools were approximately 18 feet deep. They were believed to be constructed of fitted rock walls without caulking, and to have soil bottoms, which facilitated the dissipation of the rinse waters into the subsurface. The 1989 *ECRA* states that it should be noted that the term "cesspool" was used, but in actuality they were dry wells, since they did not receive sanitary waste or wastewater discharges. In addition, a drywell was located north of the site which reportedly received surface runoff from the roof drains and the surrounding site areas (PAP-00197122).

4. Identified COCs

- PCBs (detected)
- PAHs (generated, detected)
- DDx (detected)
- Copper (detected)
- Lead (used, detected)
- Mercury (detected)

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PCBs

A landfill area was located in the central portion of the site and was reportedly used for disposal of construction debris (PAS-00101893). According to a *Report of Findings, Hydrogeologic Investigation, Phase II*, dated February 10, 1989 (1989 Phase II Report), PCBs were detected in soil in the vicinity of the landfill in one soil sample at a concentration of 4.68 parts per million (ppm) at a depth of 10 to 12 feet in 1987 (PAP-00091630).

An oil separator pond was located adjacent to the area of a process wastewater treatment building into which wastewater and oil were pumped. Solids were settled and oil was skimmed from the pond prior to the discharge of the wastewater to Weasel Brook (PAP-00090963). It is reported that use of the oil separator pond was discontinued as of 1976 (PAP-00091003). According to the 1988 Phase I Report, PCBs were detected in one soil sample in this area at a concentration of 0.17 ppm at a depth of 4.5 to five feet in 1987; no surface soil samples were collected. All other samples were reported as non-detect for PCBs (PAP-00196960).

PCBs were identified in soil near the railroad right-of-way (PAP-00091024). According to the 1988 Phase I Report, PCBs were detected in one soil sample in this area at a concentration of 16 ppm at a depth of zero to 0.5 feet in 1987. All other samples were reported as non-detect for PCBs (PAP-00196988).

PCBs were identified in soil in the vicinity of three transformers owned by the electrical utility (PAP-00090965, 1012, 1015-17). According to the 1988 Phase I Report, PCBs were detected in surface soil (zero to 0.5 feet) in this area at concentrations ranging from 0.465 ppm to 8.4 ppm in 1987 (PAP-00196973, 77).

PAHs

According to the 1989 D&D Report, on-site heat and hot water were historically produced via the burning of coal. By the mid- to-late 1960s, No. 2 fuel oil, natural gas, and propane were substituted for coal as a source for heat and hot water production (PAP-00090962, 85).

According to an *ECRA Cleanup Plan Report*, dated August 21, 1989 (1989 ECRA), a former coal gasification plant was also located on the site. The coal gasification plant was used to convert coal into "usable gas product" and to supplement energy needs for daily manufacturing operations. The specific time-period that the coal gasification plant operated is not reported (PAP-00197095; PAP-00090985).

According to the 1989 Phase II Report, high molecular weight PAHs were detected in soil associated with the landfill used for disposal of construction debris (PAS-00101893; PAP-00091634). In addition, the 1989 D&D Report indicates that PAHs were identified in soil beneath several of the site's underground storage tanks (PAP-00090976-81).

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DDx

According to a *Northern Area Soil Remedial Investigation Report and Remedial Investigation Work Plan*, dated December 21, 2005, dichlorodiphenyldichloroethylene (4,4-DDE) and dichlorodiphenyltrichloroethane (4,4-DDT) were detected in soil samples at "trace concentrations" (PAP-00197495, 541-44). 4,4-DDE was detected at a maximum concentration of 0.0028 ppm, and 4,4-DDT was detected at a maximum concentration of 0.0043 ppm in 2005 (PAP-00197495).

Copper

Copper was identified in soil in the vicinity of the landfill used for construction debris (PAS-00101909, 913). According to the 1988 Phase I Report, copper was detected at concentrations of 3 ppm to 610 ppm at a depth of 13 to 15 feet in 1987 (PAP-00196953).

Copper was identified in soil in the vicinity of the oil separator pond (PAP-00091001, 1003, 1007). According to the 1988 Phase I Report, copper was detected at concentrations of 3.3 ppm to 198 ppm at a depth of four to five feet in 1987 (PAP-00196962).

The site used three on-site cesspools/drywells from the early 1900s to approximately 1973. The three cesspools were noted to have received rinse waters from manufacturing lines. In addition, the site had a dry well located to the north which received surface runoff from the site's roof drains and surrounding site area (PAP-00090965). Copper was identified in soil near the cesspools (PAP-00090998). According to the 1988 Phase I Report, copper was detected at a maximum concentration of 175 ppm in samples collected from the bottom of the cesspools at a depth of 20 feet in 1987 (PAP-00196945).

A drum storage area was located along the western section of the main site area and was used for waste oil storage. It is reported that stained soils were observed in this area (PAP-00091013-14; PAP-00090965). According to the 1988 Phase I Report, copper was detected in one sample at a concentration of 38 ppm at a depth of 22 to 28 inches in 1987 (PAP-00196981).

Copper was identified in soil near the railroad right-of-way. According to the 1988 Phase I Report, copper was detected at concentrations of 19.6 ppm to 99 ppm at a depth of zero to six inches (PAP-00196988).

Lead

Molten lead was historically used to heat and soften steel stock (PAP-00090925). According to a *Disruption and Closure Permit Application*, dated June 1, 1989, lead dross (scum from the surface of the molten lead) and soils with elemental lead associated with operations at the site also were placed in the landfill; however, investigations, including borings and test pits, did not reveal lead dross in the landfill (PAP-00197231).

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Lead was identified in soil in the vicinity of the landfill used for construction debris (PAS-00101872, 885-88, 909, 913-14). According to the 1989 Phase II Report, lead was detected in this area at concentrations as high as 240,000 ppm at a depth of five to seven feet. A sample collected from zero to two feet had a lead concentration of 8,200 ppm; a sample collected from one to three feet had a lead concentration of 160,000 ppm (PAP-0091628).

Lead was identified in soil in the vicinity of the oil separator pond (PAP-00091000-01, 1003, 1007). According to the 1988 Phase I Report, lead was detected at concentrations of 10.5 ppm to 17,650 ppm at a depth of four to five feet (PAP-00196962).

A drum storage area was located along the western section of the main site area and was used for waste oil storage. It is reported that stained soils were observed in this area (PAP-00091013-14; PAP-00090965). According to the 1988 Phase I Report, lead was detected in one sample at a concentration of 13 ppm at a depth of 22 to 28 inches in 1987 (PAP-00196981).

Lead was identified in soil near the railroad right-of-way (PAP-00091023-24). According to the 1988 Phase I Report, lead was detected at concentrations of 190 ppm to 705 ppm at a depth of zero to 0.5 feet (PAP-00196988).

According to the 1988 Phase I Report, lead concentrations detected in soil samples in the area of the three on-site cesspools/drywells were as high as 1,470 ppm in samples collected from the bottom of the cesspools at a depth of 18 to 20 feet (PAP-00196947). According to a *Pilot Response on Soil Delineation*, dated February 24, 1997, National Standard collected a soil sample from beneath a former underground process sewer line in approximately 1988 or 1989. Lead was detected at a concentration of 590 ppm. This area of contamination was subsequently excavated in 1990. Post-excavation sample data identified lead at a maximum concentration of 217 ppm, below the New Jersey Department of Environmental Protection's (NJDEP) "residential direct contact soil cleanup criterion" of 400 ppm (PAS-00101976-78). National Standard also collected a soil sample beneath a second underground process sewer line at the same time. Excavation of this area also was conducted. Post-excavation confirmation samples had lead concentrations of 2,350 ppm (at 13-13.5 feet) and 3,770 ppm (at 16 feet). A second round of excavation occurred, and another post-excavation confirmation sample had a lead concentration of 3,840 ppm (at 23-23.5 feet). Therefore, a third round of excavation was conducted. Post-excavation sample data identified lead at a maximum concentration of 205 ppm, below the NJDEP "residential direct contact soil cleanup criterion" of 400 ppm (PAS-00101979-83). Based on review of available file material, it is unclear how these process sewer lines were connected to the site's sewer system.

Lead was identified in soil in the vicinity of three transformer pads (PAP-00090769). According to an *Expedited Remediation Investigation Report for Northern and Southern Areas*, dated February 2000, lead was detected at concentrations of 120 mg/kg to 3,500 mg/kg at a depth of zero to 0.5 feet (PAP-00090789).

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Mercury

Mercury was identified in soil in the vicinity of the landfill used for construction debris. According to the 1988 Phase I Report, mercury was detected at a maximum concentration of 0.41 ppm at a depth of 13 to 15 feet in 1987 (PAP-00196953).

Mercury was identified in soil in the vicinity of the oil separator pond. According to the 1988 Phase I Report, mercury was detected at concentrations of 0.3 ppm to 0.54 ppm at a depth of three to five feet in 1987 (PAP-00196962).

The site used three on-site cesspools/drywells from the early 1900s to approximately 1973. The three cesspools were noted to have received rinse waters from manufacturing lines. In addition, the site had a dry well located to the north which received surface runoff from the site's roof drains and surrounding site area (PAP-00090965). According to the 1988 Phase I Report, mercury was detected at a maximum concentration of 0.4 ppm in samples collected from the bottom of the cesspools at a depth of 15 to 17 feet in 1987 (PAP-00196945).

A drum storage area was located along the western section of the main site area and was used for waste oil storage. It is reported that stained soils were observed in this area (PAP-00091013-14; PAP-00090965). According to the 1988 Phase I Report, mercury was detected in one sample at a concentration of 0.16 ppm at a depth of 22 to 28 inches in 1987 (PAP-00196981).

Mercury was identified in soil near the railroad right-of-way. According to the 1988 Phase I Report, mercury was detected at concentrations of 0.28 ppm to 0.31 ppm at a depth of zero to six inches (PAP-00196988).

Historic Fill

The Allocation Team has determined that the facility site is partially located on regional Historic Fill as designated by the NJDEP.¹

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 contaminants of concern (COCs): PAHs, lead, copper, and mercury.² Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.³ PAHs, lead, copper,

¹Digital Geodata Series, DGS04-7, Historic Fill for New Jersey, <https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm>, Quadrangle #41, #52 & #53 (NJDEP map identifying locations of recognized historic fill).

² *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

³ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current

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and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.⁴

While the Allocation Team has determined that the facility is not located in an area designated by NJDEP as containing Historic Fill, it is noted that according to a *Delineation Soil Sampling in AOCs as Referenced in NJDEP Letter of May 18, 1994*, dated November 4, 1994, the upper five to ten feet of the oldest portions of site was underlain by fill material. The fill material consisted of brick fragments, reworked sand and gravel, and coal ash that was distributed over the site during former site operations as structural fill. The area where these materials were found all lie within the presently defined landfill (PAP-00091421).

Finally, it is noted that Weasel Brook was culverted in 1987 along the entire length of the site, and runs in a concrete channel in the northern portion of the site and in an enclosed culvert adjacent to the central portion of the site (i.e., Active Area) (PAP-00090921).

The maximum levels of PCBs, PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00197401-19; PAP-00196962; PAP-00196953; PAP-0091628).

COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	240,000 mg/kg
Copper	610 mg/kg
Mercury	0.54 mg/kg
Benzo(a)anthracene	12.2 mg/kg
Benzo(a)pyrene	8.963 mg/kg
Benzo(b)fluoranthene	15.359 mg/kg
Benzo(k)fluoranthene	18.105 mg/kg
Dibenzo(a,h)anthracene	0.304 mg/kg
Indeno(1,2,3-cd)pyrene	5.57 mg/kg

5. COC Pathways

Weasel Brook, a tributary to the Passaic River, runs along the western border of the site; the site is two miles inland and three miles upstream of the Passaic River (PAP-00090916).

version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

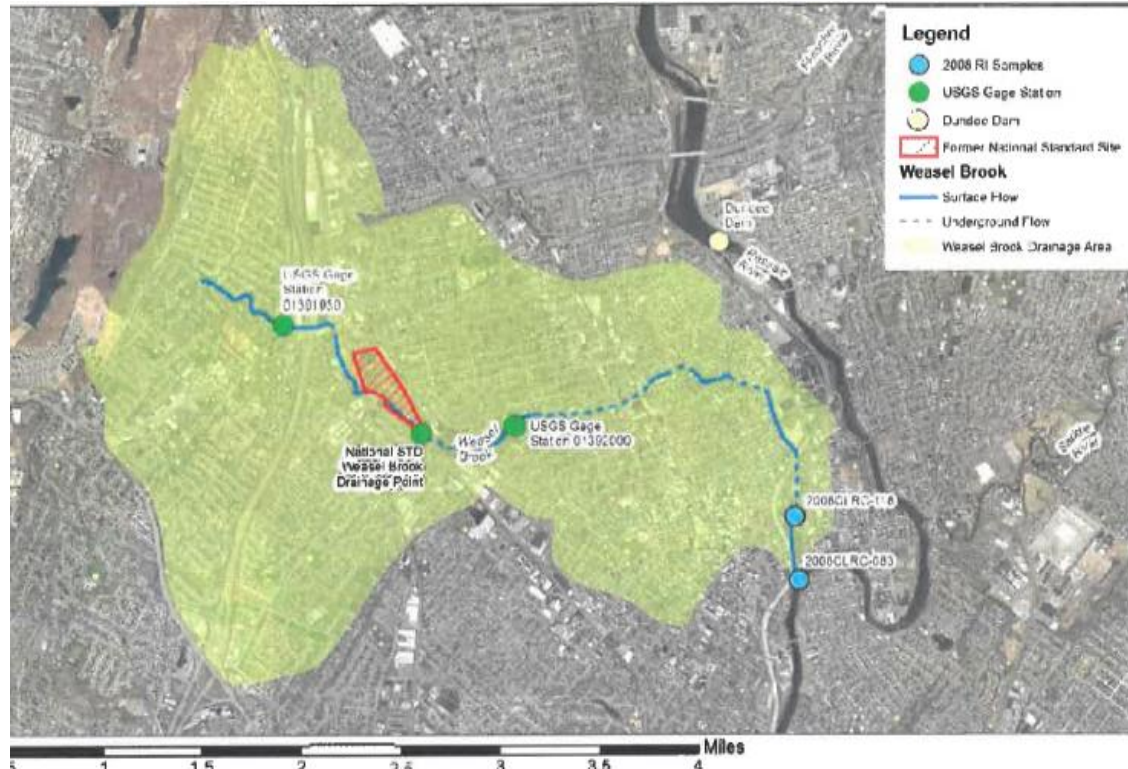
⁴ NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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The location of the site relative to the Passaic River is depicted below (PAP-00090916):



* USGS Gauging Station 01392000 also represents the location of Weasel Brook Pond.

Sanitary and Storm Sewer

Historically, rinse waters from manufacturing lines were discharged directly into cesspools from the early 1900s until approximately 1973, as discussed in a *Preliminary Assessment Report*, dated November 17, 2016 (PAP-00382596). The 1988 Phase I Report states that site pickling rinse water lines discharged to at least three, and possibly five, cesspools or dry wells until the 1970s when the discharges were connected (after pre-treatment) to the PVSC system (PAP-00196946; PAP-00090922; PAS-00101870).

As noted previously, the cesspools were approximately 18 feet deep. They were believed to be constructed of fitted rock walls without caulking, and to have soil bottoms, which facilitated the dissipation of the rinse waters into the subsurface. The 1988 Phase I Report states that it should be noted that the term “cesspool” was used, but in actuality they were dry wells, since they did not receive sanitary waste or wastewater discharges. In addition, a drywell was located north of the site which reportedly received surface runoff from the roof drains and the surrounding site areas (PAP-00197122).

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According to a letter prepared by National Standard, dated June 27, 2017, various site wastewaters were discharged to the PVSC system from the mid-1970s to 1988 under a PSVC permit (PAP-00090922). A process wastewater treatment facility was built in the mid-1970s, which was used to adjust the pH of industrial wastewater prior to discharge to the PVSC system (PAS-00101870).

National Standard received Industrial Waste Permit (3402932) for discharge into the PVSC system in 1981. The permit was effective June 1, 1981 to June 1, 1986. The permit covered sanitary waste to Outlet 1 and a second outlet that was to be metered. By August 1981, the site was to re-route non-contact cooling water away from Outlet 1 and were required to comply with monitoring requirements contained in "Interim Mercury Pretreatment Regulations" (PAP-00196916-23). The permit indicates that National Standard was not required to monitor their discharges for OU 2 COCs (PAP-00196921-22).

It is noted that according to an undated memorandum prepared by NJDEP, process wastewater discharges received no treatment, with the exception of pH adjustment, before discharge to the PVSC system, but that completion of a treatment plant was scheduled for 1983. The process wastewater volume was approximately 10,000 gallons per day and the sanitary water volume was approximately 3,000 gallons per day (PAP-00196914).

Direct Release

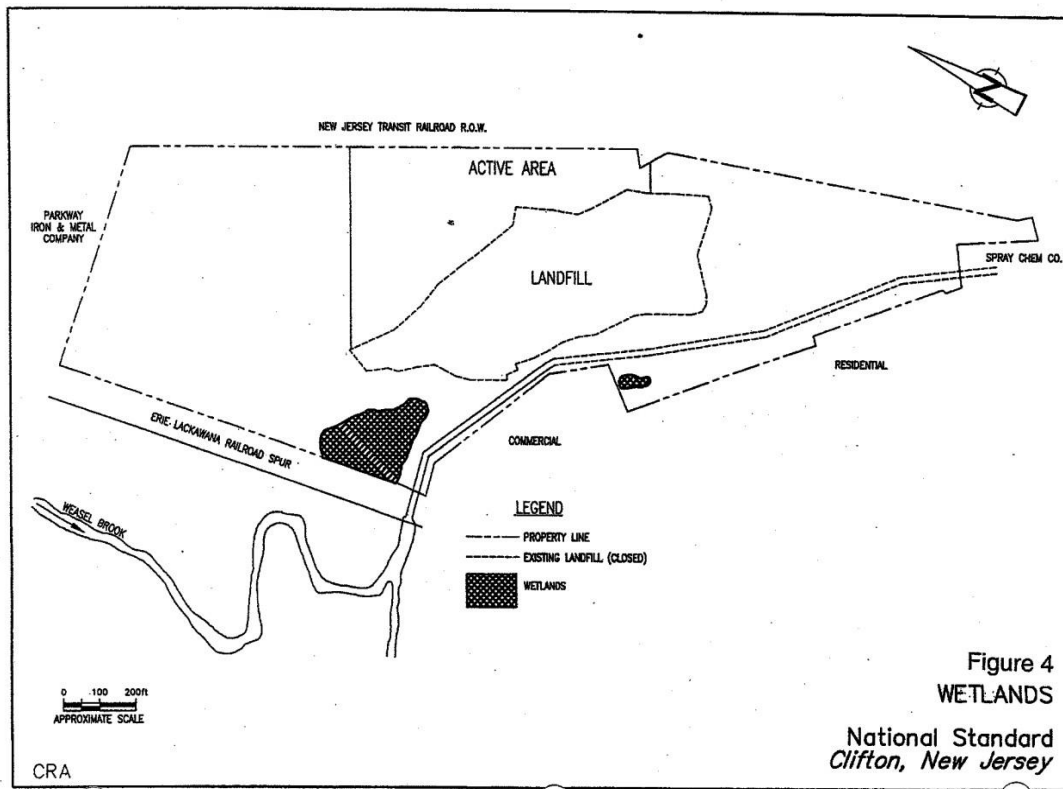
As stated previously, Weasel Brook, a tributary to the Passaic River, runs along the western border of the site (PAP-00090916).

The location of the site relative to Weasel Brook is depicted below (PAP-00090788):

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According to an undated memorandum prepared by NJDEP, the site had two discharges to Weasel Brook which consisted of non-contact cooling water from metal rolling operations (discharge 001) and from air compressors (discharge 002) (PAP-00196914). The site had a New Jersey Pollutant Discharge Elimination System (NJPDES) permit NJ0000035 for discharge of site stormwater to surface water. It is reported that non-contact cooling water from rolling operations and air compressors, as well stormwater were discharged via Outfalls 001 and 002 to Weasel Brook (PAP-00090932). A copy of the permit was not identified in the available file material. It is noted that PVSC reported that, as of July 1972, "polluting discharges" were occurring from three of four outlets to Weasel Brook (as opposed to two outfalls) (PAS-00101850, 52-54).

Based on review of the PVSC violation documentation for August 14 to December 31, 1972, following the PVSC inspection in July 1972 which reported "polluting discharges" to Weasel Brook, the site agreed at the end of 1972 to connect the boiler house drain to the city sewer, seal the site cesspools, and pump their waste into holding tanks for scavenger disposal. PVSC reported that the required steps to end the discharges were made by July 1973 (PAS-00101850, 52-54).

According to the 1989 D&D Report, an oil separator pond was located adjacent to the area of the process wastewater treatment facility into which wastewater and oil were pumped. Solids were settled and oil was skimmed from the pond prior to the discharge of the wastewater to Weasel Brook (PAS-00101870). Use of the oil separator pond was discontinued as of 1976 (PAS-00101910).

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It is noted that Weasel Brook was culverted in 1987 along the entire length of the site, and runs in a concrete channel in the northern portion of the site and in an enclosed culvert adjacent to the central portion of the site (i.e., Active Area) (PAP-00090921).

According to a *Disruption and Closure Permit Application*, dated June 1, 1989, site drainage occurred through sheet flow to Weasel Brook or conveyance through existing concrete pipe storm sewer lines. One pipeline conveyed water from the northern most buildings and discharged along the slope, north of landfill. The other pipeline drained the southern half of the buildings and conveyed water through a 15-inch pipe at a manhole, near the wastewater treatment plant. Additional drainage from the building roofs discharged to the surface along a railroad spur. Drainage of the southern portion of the site occurred through drop inlets in the piped section of Weasel Brook (PAP-00197245).

An *Expedited Remedial Investigation Report for Northern and Southern Areas*, dated February 2000, states that Weasel Brook drained the site and the surrounding area. Rain ran off to the low area to the southwest of the former Main Building area, and to the low area to the southeast of the former Main Building area. This runoff and all other local surface runoff was received by Weasel Brook, which flowed through the site, and discharged into the Passaic River to the east of the site (PAP-00090753; PAP-00090767). Further, groundwater was reported to discharge into Weasel Brook during the seasonal low water table that occurs in October (PAS-00101871). However, NJDEP concluded that there is no hydraulic connection between the site and Weasel Brook since culverting was completed (PAP-00090921).

Spills

With respect to the observed releases to Weasel Brook, it is noted that in 1947, patches of oil film observed in Weasel Brook were traced by PVSC to the site. A waste lubricating oil separator pit was found to be flooded and overflowing into the "clear water discharge line" to Weasel Brook. National Standard reportedly cleaned the pit out "at once" (PAS-00101848).

6. Regulatory History/Enforcement Actions

Inspections

According to an undated memorandum prepared by NJDEP, the site was inspected on June 17, 1981, to determine whether the permittee was in compliance with the requirements of their NPDES Permit (No. NJ0000035) issued on September 30, 1980 (PAP-00196914). No deficiencies with respect to COCs were noted based on review of the document.

Violations/Enforcement Actions

According to a PVSC *Annual Report*, dated 1973, on August 14, 1972 PVSC inspectors collected samples of discharges from site outfalls, and analysis showed the samples "were polluting." On August 16, 1972, PVSC wrote to National Standard, informing them

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of the pollution and directing that they cease polluting at once. On August 21, 1972, National Standard replied that they had temporarily diverted the flow from entering Weasel Brook. On December 14, 1972, National Standard agreed to connect the boiler house drains to the city sewer and to seal the cesspools and handle the waste by pumping it to holding tanks for scavenger disposal. They estimated they could complete the work by the end of March 1973. On July 9, 1973, PVSC received a call and inspection revealed that the cesspool had been sealed, a 6,000-gallon fiberglass storage tank and piping installed, and the system ready for operation (PAS-00034750-52). No information on whether COCs were detected in the discharge was available.

NJDEP issued an Administrative Order and Notice of Civil Administrative Penalty Assessment to National Standard in August 1987 due to improper hazardous waste storage and management (PAS-00004222-28).

Permits

According to a letter prepared by National Standard, dated June 27, 2017, various site wastewaters were discharged to the PVSC system from the mid-1970s to 1988 under a PSVC permit (PAP-00090922). A process wastewater treatment facility was built in the mid-1970s, which was used to adjust the pH of industrial wastewater prior to discharge to the PVSC system (PAS-00101870).

The site had a NJPDES permit (NJ0000035) for discharge of site stormwater to surface water. It is reported that non-contact cooling water from rolling operations and air compressors, as well stormwater were discharged via Outfalls 001 and 002 to Weasel Brook (PAP-00090932). A copy of the permit was not identified in the available file material.

National Standard received Industrial Waste Permit (3402932) for discharge into the PVSC system in 1981. The permit was effective June 1, 1981 to June 1, 1986. The permit covered sanitary waste to Outlet 1 and a second outlet that was to be metered. By August 1981, the site was to re-route non-contact cooling water away from Outlet 1 and were required to comply with monitoring requirements contained in Interim Mercury Pretreatment Regulations (PAP-00196916-23). The permit indicates that National Standard was not required to monitor their discharges for OU 2 COCs (PAP-00196921-22).

7. Response Actions

Characterization Activities

The following is a list of major response action documents identified in the available file material:

- *Report of Findings, Phase I Sampling and Analysis for National Standard*, dated March 29, 1988 (PAP-00196932);
- *Report of Findings, Hydrogeologic Investigation, Phase II*, dated February 10, 1989 (PAP-00091594);

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- *ECRA Cleanup Plan Report*, dated December 1989 (PAP-00091429);
- *Delineation Soil Sampling in AOCs as Referenced in NJDEP Letter of May 18, 1994*, dated November 4, 1994 (PAP-00091412);
- *Expedited Remediation Investigation Report for Northern and Southern Areas*, prepared for National-Standard, dated February 2000 (PAP-00090753);
- *Site Investigation Report*, dated October 2001 (PAP-00090726); and,
- *Northern Area Soil Remedial Investigation Report and Remedial Investigation Work Plan*, dated December 21, 2005 (PAP-00197474).

Sewer

National Standard collected a soil sample from beneath a former underground process sewer line in approximately 1988 or 1989, as discussed in a *Pilot Response on Soil Delineation*, dated February 24, 1997. Lead was detected at a concentration of 590 ppm. This area of contamination was subsequently excavated in 1990. National Standard also collected a soil sample beneath a second underground process sewer line at the same time. Excavation of this area also was conducted. Post-excavation confirmation samples had lead concentrations of 2,350 ppm and 3,770 ppm. A second round of excavation occurred, and another post-excavation confirmation sample had a lead concentration of 3,840 ppm. Therefore, a third round of excavation was conducted and confirmation sample concentrations were below the NJDEP's "residential direct contact soil cleanup criterion" (PAS-00101976-80). Based on review of available file material, it is unclear how these process sewer lines were connected to the site's sewer system.

Weasel Brook

According to a letter report prepared by National Standard's environmental consultant, dated October 13, 2006, surface water and sediment samples were collected from three locations in Weasel Brook after National Standard's receipt of EPA's General Notice Letter in November 2005. The purpose of collecting the data was twofold: (1) determine whether there are contaminants of concern in Weasel Brook at levels that could potentially impact the Passaic River and (2) determine whether the site could potentially be a source of any impact (PAS-00107896). One surface water/sediment sample was collected upstream of the site and two surface water/sediment samples were collected downstream of the site (approximately 2,400 feet and 2,800 feet downstream, respectively). Samples were analyzed for PCBs, PAHs, and metals. Results were as follows:

- Benzo(b)fluoranthene and pyrene were detected in the surface water sample collected from Weasel Brook Park Lake inlet (i.e., the first downstream sample) at concentrations below their respective "NJDEP surface-water standards" (PAS-00107899). Neither constituent was detected in the sample collected from the Weasel Brook Park Lake discharge location (i.e., the furthest downstream sample location) (PAS-00107902).

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- The concentration of mercury [(0.157 micrograms per Liter (µg/L)] slightly exceeded its “standard” (0.144 µg/L) in the Weasel Brook Park Lake inlet sample (PAS-00107899, 912). According to the letter report prepared by National Standard’s consultant, dated October 13, 2006, the “isolated, low-level” observance of mercury is not indicative of any identifiable potential source (PAS-00107900).
- The sediment sampling results showed the presence of “several PAHs and metals at concentrations exceeding applicable sediment screening criteria.” These exceedances were identified in the sample collected from the Weasel Brook Park Lake discharge (i.e., the furthest downstream sample) and in the upriver sample. The intermediate sample location (i.e., the first downstream sample location) exhibited “no PAH detections above applicable guidance values.” The same observation was reported for metals.
- Overall, the letter report prepared by National Standard’s consultant, dated October 13, 2006, concluded that while select PAHs and metals, “marginally exceed their surface water or sediment quality criteria,” the data show that the National Standard site “is not the source for these observed constituents in water and sediment.” The letter report also concluded that “the distribution of these constituents points to potential upriver as well as potential alternate downriver sources (including natural background) for the constituents and concentrations observed in Weasel Brook” (PAS-00107901).
- No PCBs were detected in either sediment or water samples along the study reach of Weasel Brook (PAP-00090920; PAS-0010789-900).

Based on the results of the evaluation, the consultant concluded “there is no data to support U.S. EPA's assertion that the former National-Standard facility in Clifton, New Jersey is connected to the contamination in the Study Area” (PAS-00107896).

Soil

Between 1984 and 1994, COCs were identified in soil associated with the following operations (petroleum hydrocarbons detections are noted as they may be indicative of COC releases):

- A landfill area was located in the central portion of the site and was reportedly used for disposal of construction debris (PAS-00101893). Petroleum hydrocarbons, lead, copper, and PCBs were identified in soil in the vicinity of the landfill (PAS-00101872, 909, 911-13). According to the 1988 Phase I Report, lead was detected at a concentration of 41,200 ppm at a depth of 13 to 15 feet. Copper was detected at concentrations of 3 ppm to 610 ppm at a depth of 13 to 15 feet. Mercury was detected at a maximum concentration of 0.41 ppm at a depth of 13 to 15 feet (PAP-00196953). In addition, according to the 1989 Phase II Report, lead was detected in this area at concentrations at high as 240,000 ppm at a depth of five to seven feet. A sample collected from zero to two feet

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had a lead concentration of 8,200 ppm; a sample collected from one to three feet had a lead concentration of 160,000 ppm (PAP-0091628). PCBs were detected at a maximum concentration of 4.68 ppm (PAP-00091630). High molecular weight PAHs were detected in soil associated with the landfill area (PAP-00091634).

- A spray pond was located adjacent to the power house and former coal gasification and steam power plants and used as a cooling pond (PAP-00090963; PAP-00091008). Petroleum hydrocarbons were identified in soil in the vicinity of the spray pond (PAP-00091008, 1011; PAP-00196964).
- An oil separator pond was located adjacent to the area of a process wastewater treatment facility into which wastewater and oil were pumped. Solids were settled and oil was skimmed from the pond prior to the discharge of the wastewater to Weasel Brook (PAP-00090963). It is reported that use of the oil separator pond was discontinued as of 1976 (PAP-00091003). Petroleum hydrocarbons, lead, copper, and PCBs were identified in soil in the vicinity of the oil separator pond (PAP-00091000-01, 1003, 1007). According to the 1988 Phase I Report, lead was detected at concentrations of 10.5 ppm to 17,650 ppm at a depth of four to five feet. Copper was detected at concentrations of 3.3 ppm to 198 ppm at a depth of four to five feet. Mercury was detected at concentrations of 0.3 ppm to 0.54 ppm at a depth of three to five feet (PAP-00196962). PCBs were detected in soil in this area at a maximum concentration of 0.17 ppm (PAP-00196960).
- Petroleum hydrocarbons, PCBs, pesticides, metals, and lead were identified in soil near the railroad right-of-way (PAP-00091023-24). According to the 1988 Phase I Report, lead was detected at concentrations of 190 ppm to 705 ppm at a depth of zero to 0.5 feet. Copper was detected at concentrations of 19.6 ppm to 99 ppm at a depth of zero to six inches. Mercury was detected at concentrations of 0.28 ppm to 0.31 ppm at a depth of zero to six inches (PAP-00196988). PCBs were detected in soil in this area at a maximum concentration of 16 ppm in 1987 (PAP-00196988).
- The site used three on-site cesspools/drywells from the early 1900s to approximately 1973. The three cesspools were noted to have received rinse waters from manufacturing lines. In addition, the site had a dry well located to the north of which received surface runoff from the site roof drains and surrounding site area (PAP-00090965). Petroleum hydrocarbons, lead, and copper were identified in soil near the cesspools (PAP-00090996-98). According to the 1988 Phase I Report, lead concentrations detected in soil samples were as high as 1,470 ppm in samples collected from the bottom of the cesspools at a depth of 18 to 20 feet (PAP-00196947). Copper was detected at a maximum concentration of 175 ppm in samples collected from the bottom of the cesspools at a depth of 20 feet. Mercury was detected at a maximum concentration of 0.4 ppm in samples collected from the bottom of the cesspools at a depth of 15 to 17 feet (PAP-00196945).

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- A drum storage area was located along the western section of the main site area and was used for waste oil storage. It is reported that stained soils were observed in this area (PAP-00090965, 1013-14). Petroleum hydrocarbons and metals were identified in soil near the drum storage area (PAP-00091013, 1018-19). According to the 1988 Phase I Report, copper was detected in one sample at a concentration of 38 ppm at a depth of 22 to 28 inches. Lead was detected in one sample at a concentration of 13 ppm at a depth of 22 to 28 inches. Mercury was detected in one sample at a concentration of 0.16 ppm at a depth of 22 to 28 inches (PAP-00196981).
- Petroleum hydrocarbons, PCBs, and lead were identified in soil in the vicinity of three transformer (PAP-00090965, 1012, 1015-17; PAP-00090769). According to the Phase I Report, PCBs were detected in soil in this area at a maximum concentration of 8.4 ppm in 1987 (PAP-00196973, 77). According to an *Expedited Remediation Investigation Report for Northern and Southern Areas*, prepared for National-Standard, dated February 2000, lead was detected at concentrations of 120 mg/kg to 3,500 mg/kg at a depth of zero to 0.5 feet (PAP-00090789).
- Petroleum hydrocarbons, PAHs, and lead were identified in soil beneath "several" of the site's underground storage tanks (PAP-00090966, 976-81, 1028-29). According to a 1989 D&D Report, PAHs were identified in soil beneath several of the site's underground storage tanks (PAP-00090976-81). Lead concentration data were not identified in the 1989 D&D Report.

According to a *Revised Soil and Groundwater Remedial Investigation Work Plan*, dated February 25, 2005, a total of 44 areas of concern (AOCs) have been identified at the site (PAP-00197351). Lead was detected in soil at each AOC based on sampling conducted in 1990 and 1991 (PAP-00197400-49). The maximum reported concentration of lead was 87,000 ppm. This data is listed as being associated with both AOC 8 (the area between the former Main Building and the railroad track areas) and AOC 37 (the area of the former transformer located within former Building No. 5) (PAP-00197360, 363, 418, 44). In addition, PCBs were associated with AOC 6 (former locations of Buildings 2, 3, 4, 6, and 14), AOC 8 (the area between the former Main Building and the railroad track areas), AOC 9 (Transformer Substation No. 1), AOC 36 (stained soil along railroad tracks), AOC 37 (former transformer in Building 5), and the landfill area. The maximum detected concentration of PCBs was 16 mg/kg (PAP-00197408-10, 17-18, 20, 43-44). The northern section of the site was acquired separately in the mid-to-late 1950s. According to a *Northern Area Soil Remedial Investigation Report and Remedial Investigation Work Plan*, dated December 21, 2005, DDx compounds were detected in soil samples at "trace concentrations" (PAP-00197495, 541-44). 4,4-DDE was detected at a maximum concentration of 0.0028 ppm, and 4,4-DDT was detected at a maximum concentration of 0.0043 ppm in 2005 (PAP-00197495).

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Remedial Activities

The site was closed and demolished in 1988/1989. Numerous site investigations and remedial activities were conducted at the site following its closure in 1988 under the oversight of the NJDEP (PAP-00090917-18; PAP-00195394). National Standard entered into a Remediation Agreement with NJDEP in 1999 (PAP-00382460-67).

Responses to NJDEPE Letter of May 18, 1994, with Regard to the 0-2 Foot Activities Conducted at the National Standard Company, dated August 15, 1994, states that the soil interval from zero to two feet below ground surface (bgs) was excavated at 22 AOCs, primarily to address lead contamination (PAP-00091124-47).

According to a *Delineation Soil Sampling in AOCs as Referenced in NJDEP Letter of May 18, 1994*, dated November 4, 1994, as a result of all the field investigative sampling activities at the site, remedial action was proposed to address 12 "cleanup areas." The remedial activities involved the excavation of soils in the 12 identified areas. These 12 cleanup areas included the cesspools and drywells, landfill, oil separating pond, spray pond and fuel house, transformer west of Building 28-A, former PSE&G (Public Service Electric and Gas Company) substations, drum storage area, compressor blowdown area, stained soils along railroad tracks, inactive septic tanks, underground storage tanks, aboveground storage tanks, and building demolition areas. In July 1990, an *Addendum to the ECRA Cleanup Plan Report*, dated July 27, 1990, was submitted to the NJDEP. This addendum report focused on additional excavation of the cleanup areas to depths greater than originally proposed to achieve a former site cleanup standard of 250 ppm for lead. As a result, 29 cleanup areas were then identified as requiring further action. Eight of these cleanup areas were new areas located outside the boundaries established for the original 12 cleanup areas. The other 21 proposed cleanup areas were deeper excavations within the original 12 proposed cleanup areas. This totaled 41 proposed cleanup areas at the site (PAP-00091427-28). From August through November 1990, field work was conducted, and 870 post-excavation samples were collected (PAP-00091428).

As discussed in a *Pilot Response on Soil Delineation*, dated February 24, 1997, National Standard collected a soil sample from beneath a former underground process sewer line in approximately 1988 or 1989. Lead was detected at a concentration of 590 ppm. This area of contamination was subsequently excavated in 1990. National Standard also collected a soil sample beneath a second underground process sewer line at the same time. Excavation of this area also was conducted. Post-excavation confirmation samples had lead concentrations of 2,350 ppm and 3,770 ppm. A second round of excavation occurred, and another post-excavation confirmation sample had a lead concentration of 3,840 ppm. Therefore, a third round of excavation was conducted and confirmation sample concentrations were below the NJDEP's "residential direct contact soil cleanup criterion" (PAS-00101976-80). Based on review of available file material, it is unclear how these process sewer lines were connected to the site's sewer system.

Petroleum hydrocarbons, PCBs, and lead were identified in soil in the vicinity of three transformer owned by the electrical utility (PAP-00090965, 1012, 1015-17). According to an *Expedited Remediation Investigation Report for Northern and Southern Areas*, dated

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February 2000, this area was excavated to a depth of 2.5 feet bgs, and seven confirmation sample results were below the NJDEP "Residential Direct Contact Soil Cleanup Criteria" (PAP-00195403). According to a *Site Investigation Report*, dated October 2001, approximately 146 cubic yards of PCB and petroleum-impacted soil was excavated from this area and disposed off-site (PAP-00090728).

Petroleum hydrocarbons, lead, and copper were identified in soil near the cesspools (PAP-00090996-98). According to an *Expedited Remediation Investigation Report for Northern and Southern Areas*, dated February 2000, National Standard excavated 260 cubic yards of soil from this area to a depth of 27 feet bgs to remove lead above concentrations of 250 mg/kg (PAP-00090771).

According to a *Revised Soil and Groundwater Remedial Investigation Work Plan*, dated February 25, 2005, for the purpose of redeveloping the property, the former National Standard site was divided into four large areas including: , (1) the Southern Area; (2) the Northern Area; (3) the Active Area of the former steel plant; and (4) the Landfill Area. Previous soil sampling conducted by National Standard has established "clean" boundary lines separating the "relatively uncontaminated" Northern and Southern Areas from the contaminated Active Area and the Landfill. A total of 44 areas of concern AOCs were identified at the site (PAP-00197351). The following is a list of excavations that were conducted at the AOCs:

- AOC 9 consists of the former transformer pads in the Southern Area. AOC 9 was excavated to a depth of 2.5 feet bgs.
- AOC 10 consists of a former dry well and underground stoup sewer lines located in the Northern Area. The area was excavated to a depth of 15.5 feet bgs.
- AOC 14 consists of the former cesspool D area located in the Northern Area. AOC 14 was excavated to a depth of 27 feet bgs and 260 cubic yards of soil were removed.
- AOC 15 is the location of former Building No. 39. This area was excavated to depths ranging from 4.75 to 7.5 feet bgs.
- AOC 18 is located within the area of former Building No. 39 and within AOC 5. This area was excavated to a depth of 8 feet bgs.
- AOC 24 is the area of former Building No. 39 and is located within AOC 5. The area was excavated to 11.5 feet bgs.
- AOC 26 is in the area of former Building No. 9 and is located within AOC 5. AOC 5 was excavated to an average depth of 6 feet bgs. AOC 26 was excavated to a depth of 14 feet bgs.
- AOC 27 is in the area of former Building No. 8 and is located within AOC 5. This area was excavated to a depth of 9.5 feet bgs.
- AOC 30 is located in the area of former Building No. 7 and was excavated to a depth of 5 feet bgs.
- AOC 4 is the location of former Building No. 7. AOC 4 was excavated to a depth of 5 feet bgs.
- AOCs 6E and 6F are located within AOC 6, which was excavated to 5 feet bgs. AOCs 6E and 6F were excavated to depths of 10 feet and 8 feet bgs.

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- AOCs 11 and 17 are located in the area of the former underground process sewer. The resulting excavation was 14.5 feet bgs.
- AOC 12 is the former underground storm sewer line. The area was excavated to a depth of 11.5 to 16 feet bgs.
- AOC 16 is an area of the former underground process sewer lines. AOC 16 was excavated to a depth of 8.5 feet bgs.
- AOC 19 is the area of former Building No. 30 and is located west and outside of AOC 5. The area was excavated to a depth of 3.5 to 4.0 feet bgs.
- AOC 20 is the location of the former underground process sewer line located within AOC 2. AOC 2 was excavated to a depth of 5 feet bgs. The excavation in AOC 20 was extended to 9 feet bgs.
- AOC 21 is the location of the former underground process sewer line. The area was excavated to depths ranging from 13 to 18 feet bgs.
- AOC 22 is located between AOC 21 and the on-site landfill. This area was excavated to 22 feet bgs.
- Area 25 is the former concrete pipe trench located west of Building Nos. 28 and 28A and adjacent to AOC 2. The area was excavated to 10 feet bgs.
- AOC 28 is the area of former Building No. 7A and is located within AOC 4, which was excavated to a depth of 5 feet bgs. Several phases of excavation were conducted in AOC 28 with the resulting excavation extended to 9 feet bgs.
- AOC 29 is located in the area of former Building No. 8. The area was excavated to a depth of 4.0 to 4.5 feet bgs.
- AOC 31 is the area of former Building No. 28 and is located within AOC 5. AOC 5 was initially excavated to 5 feet bgs and the excavation in AOC 31 was extended to 8 feet bgs.
- AOC 32 is the area of former Building No. 28 and is located within AOC 5. The area was excavated to 9.5 feet bgs.
- AOC 34 is the area of former Building No. 10 and is located within AOC 5. This area was excavated to 13 feet bgs, but the excavation was extended to 19 feet bgs.
- AOC 35 is the area of former Building No. 8 and is located within AOC 5. The area was excavated to a depth of 9.5 feet bgs. Two additional excavations were conducted in this area: one was extended to 12 feet bgs and the other was extended to 15 feet bgs.
- AOC 36 is located in the former railroad area along the northern property boundary. The area was excavated to a depth of 8.5 feet bgs.
- AOC 37 is the area of the former transformer located within former Building No. 5. The area was excavated to 20 feet bgs.
- AOC 38 is the area of the former Building No. 6 and is located within AOC 6. The area was excavated to 9.5 feet bgs.
- AOC 40 is the area of the former Building No. 4 and is located within AOC 6. The area was excavated to 10 feet below.
- AOC 42 is the location of removed subsurface piping. The subsurface pipe and surrounding soils were excavated and post-excavation samples were collected from the 6.5 to 7.0-foot depth interval.

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- AOC 1 consists of a former oil/water separator located on the western side of the on-site landfill and includes AOC 41 (Area Adjacent to the Former Oil/Water Separator). AOC 1, including AOC 41, was excavated to a depth of 4.5 feet bgs.
- AOC 2 is the location of former Building No. 28 and includes portions of AOC 20 (Former Location of Process Sewer Line) and AOC 25 (Area of Former Concrete Pipe Trench Located West of Building Nos. 28 and 28A). Remediation of this AOC was conducted via many small excavations over many phases.
- AOC 3 is the location of former Building Nos. 7 and 4. AOC 3 was excavated to a depth of 8.5 feet bgs.
- AOC 5 is a large area that incorporates many smaller AOCs. AOC 5 was excavated to an average depth of 5 feet bgs. Areas 33A and 35A were excavated to depths of 18 and 15 feet bgs, respectively.
- AOC 6 consists of the area of former Building Nos. 2, 3, 4, 6 and 14 (includes a portion of AOC 8) and is located to the northeast of the on-site landfill. The area was excavated to a depth of 5 feet bgs.
- AOC 6C is located immediately north of the on-site landfill in the southern portion of AOC 6. The area was excavated to a depth of 5 feet bgs.
- AOC 7 is in the area between former Building Nos. 6A and 8. The area was excavated to a depth of 6 feet bgs.
- AOC 8 is the area between the former Main Building and the railroad track areas. The area was excavated to a depth of 3 feet bgs.
- AOC 13 is the former Cesspool B area and is located within the western corner of AOC 5. AOC 5 was excavated to a depth of 6 feet bgs. AOC 13 was excavated further to a depth of 20.5 feet bgs.
- AOC 23 is the former concrete pipe trench located west of the plant building. The concrete pipe trench and adjacent soils were excavated to a depth of 3 feet bgs initially. The excavation was extended to 7 feet bgs.
- AOC 33 is the area of former Building Nos. 10 and 11 and underground process sewer lines (located within AOC 5). The area was excavated to 12 feet bgs initially. The excavation was extended to 18 feet bgs.
- AOC 39 is the area of the former Building No. 4 and is located within AOC 6. The area was excavated to a depth of 10 feet bgs initially. The excavation was extended to 15 feet bgs (PAP-00197355-64).

Each of the excavations were conducted primarily to address lead contamination. PCBs detected at AOCs 36, 37, and 8 were also addressed via these excavations. Post-excavation confirmation samples were collected at each excavation (PAP-00197355-64).

NJDEP issued a "no further action" determination for the Southern Area in a letter dated May 10, 2002. This portion of the site was subsequently redeveloped as senior housing by the City of Clifton (PAP-00197351). The Northern Area also received a "no further action" determination for soil from NJDEP on November 17, 2006 (PAP-00384059). The central and eastern portions of the site were capped and "closed." Buildings in the area formerly used for manufacturing operations in the northeastern portion of the site were demolished and soil remediation was conducted (PAP-00090917-18; PAP-00195394). Further information on the remedial efforts in the northeastern portion of the site was not identified in the referenced document. Review of a *Remedial Investigation Report*

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Addendum, dated February 28, 2017, indicates that remediation of the Active Area of the former steel plant and Landfill Area is ongoing (PAP-00384059-60).

8. Summary of Asserted Defenses

National Standard asserts the following:

- That any release of petroleum, including crude oil of any fraction thereof, is not a CERLCA hazardous substance under 42 U.S.C. §9601(14).
- The federally permitted exclusion applies to National Standard's discharge under 42 U.S.C. §9607(J).

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NEU HOLDINGS U.S. CORPORATION

Note: EPA originally identified Eden Wood Corporation, a Delaware Corporation, (“Eden Wood”) as the PRP and successor entity to the Whippany Paper Board Co., Inc. (“WPBC”) facility at 1 Ackerman Avenue in Clifton, NJ (“Clifton Mill”) that is the subject of this data report. Additional corporate research completed in responding to a 104(e) request received from EPA confirmed that Neu Holdings U.S. Corporation (“Neu Holdings”)—and not Eden Wood—is the successor to WPBC. Neu Holdings will henceforth be identified as the PAP associated with the WPBC facility.

Facility Address and Size: 1 Ackerman Avenue, Clifton, New Jersey. According to a 1987 boundary survey of the site, the site consisted of a “Clifton Tract” (5.497 acres) and “Passaic Tract” (1.488 acres) totaling 6.985 acres (PAP-00198414-415). According to the New Jersey Department of Environmental Protection (NJDEP) Environmental Cleanup Responsibility Act (ECRA) General Information Submission (GIS) in 1987, the legal description was City of Clifton Block 4-15, Lot 1 and 2 and City of Passaic Block 51 Lot 1. The document did not state the acreage (PAS-00113546). The site is to the east by the Passaic River, to the west by the former Dundee Canal, and to the north by Ackerman Avenue. The Passaic River bank is shored up by sheet pilings (PAS-00113605). Note: The Dundee Canal no longer exists. It was filled to accommodate Route 21 Freeway between 1997 and 2005 (PAP-00198505). According to Neu Holdings U.S. Corporation’s Response to the EPA’s Request for Information pursuant to CERCLA 104(e), this facility is located at RM 17.2, 8.9 miles from the northern terminus of OU2. According to the Industrial Directory of New Jersey the number of employees for 1940-1941 was 189 (PAS-00113455-56). According to the Industrial Directory of New Jersey the number of employees for 1946 was 275 (PAS-00113458-59). A Herald-News article from June 11, 1982, stated that the facility once employed 150 employees (PAS-00113961). Note: No other information regarding the number of employees was found in the documents provided for this report. A Securities and Exchange Annual Report dated 1971 stated that the business worked a 24-hour day, five to six days a week (PAP-00102308).

See the following 2017 EDR Aerial Photo for site location. The site is outlined in red.



(PAP-00374493)

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1. **Business Type:** Manufactured paperboard products using recycled waste paper as raw material. The plant produced unbleached container board, unbleached box board, and other unbleached paper boards. The plant also produced roofing felt for a time in the 1970s (PAP-00102359-62).

2. **Time Period of Ownership/Operations**

Owner: 1933-1987

Operator: 1933-1980

1933: On January 5, 1933, Frank Desiderio Sons, Inc. transferred title to the Clifton Plant to Clifton Paper Board Co., Inc. (PAP-00374468), which was incorporated in New Jersey in October 1932 (PAP-00198402). .
WPBC was incorporated in November 1933 (PAP-00198401).

1946: Botany Worsted Mills transferred title to Block 1051 Lot 1 to Clifton Paper Board Company, Inc. on February 1, 1946 (PAP-00374471).

1955: Clifton Paper Board Company, Inc. and WPBC were merged in 1955 and the surviving entity of the merger was WPBC (PAP-00198403, 7).

1980: WPBC filed for Chapter 11 Bankruptcy proceedings in February 1980 and planned to reorganize and partially liquidate assets, including the Clifton Mill (PAP-00102373-417).

According to the 2006 PRP DEF, WPBC filed for Chapter 11 bankruptcy in February 1980 but continued to operate the company until June 1980, when funds ran short (PAS-00113427); however, an article in The Herald News, dated June 1982, noted that the Clifton Mill had been partially gutted by fire in April 1980 and had never reopened (PAS-00113961).

On November 10, 1980, WPBC submitted a proposed Plan of Reorganization under Chapter 11 of the Bankruptcy Code. The plan of reorganization is by means of partial liquidation of assets (PAP-00102373).

1981: In March 1981, the Bankruptcy Court issued a Confirmation Order for WPBC's Chapter 11 Plan, which discharged WPBC from any and all debts arising prior to entry of the Confirmation Order (PAP-00102386-87). WPBC did not operate the Clifton Mill after issuance of the Confirmation Order (PAS-00113953).

1986: NPN, Inc., a Delaware corporation, acquired approximately 76% of the outstanding shares of WPBC and subsequently merged into WPBC (PAS-00113547-48). A December 1986 Administrative Consent Order ("1986 ACO") in connection with an NJDEP ECRA-triggered transaction states that NPN, Inc. had made a tender offer for all of WPBC's stock (PAS-00113661).

1987: On October 1, 1987, WPBC sold the facility site (City of Clifton Block 4-15, Lot 1 and 2 and City of Passaic Block 1051, Lot No. 1) to an unrelated third party, V. Ponte & Sons, Inc., a New York Corporation (PAP-00102234-42). On October 8,

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1987, Ponte's counsel informed NJDEP that pursuant to the contract of sale with WPBC, Ponte agreed to assume the responsibility of achieving ECRA compliance for the facility site under the 1986 ACO (PAS-00113513).

In December 1988, Ponte sold Clifton Block 4-15, Lot 1 and 2 and Passaic Block 1051, Lot No. 1 to Recycled Paper Board, Inc. of Clifton, New Jersey (PAP-00102243).

2005: Recycled Paper Board, Inc. ceased operations at the facility (PAP-00198428).

3. Operational History/COC Use and Presence at the Facility

Based on title research and Sanborn maps, the property was developed and owned/operated by others for paper board product manufacturing dating back to at least 1903, when it was owned by Carlton Paper Co (PAP-00374489). In 1971 the facility had an estimated annual capacity of approximately 82,500 tons and operated at 75% capacity (PAP-00102308). In 1978, WPBC had an estimated annual capacity of approximately 82,500 tons of product and was operating at 58% of capacity. At that time, WPBC occupied 169,600 square feet of floor space, truck-docking facilities were located onsite, and rail transportation was nearby (PAP-00102357; PAS-00113427).

According to a 1971 Securities and Exchange Annual Report, the facility engaged in the business of manufacturing and selling containerboard, boxboard and other grades of paperboard. The products were processed from substantially all recycled material. During 1970, the facility also commenced production and sale of roofing felt used in the building industry (PAP-00102302, 308).

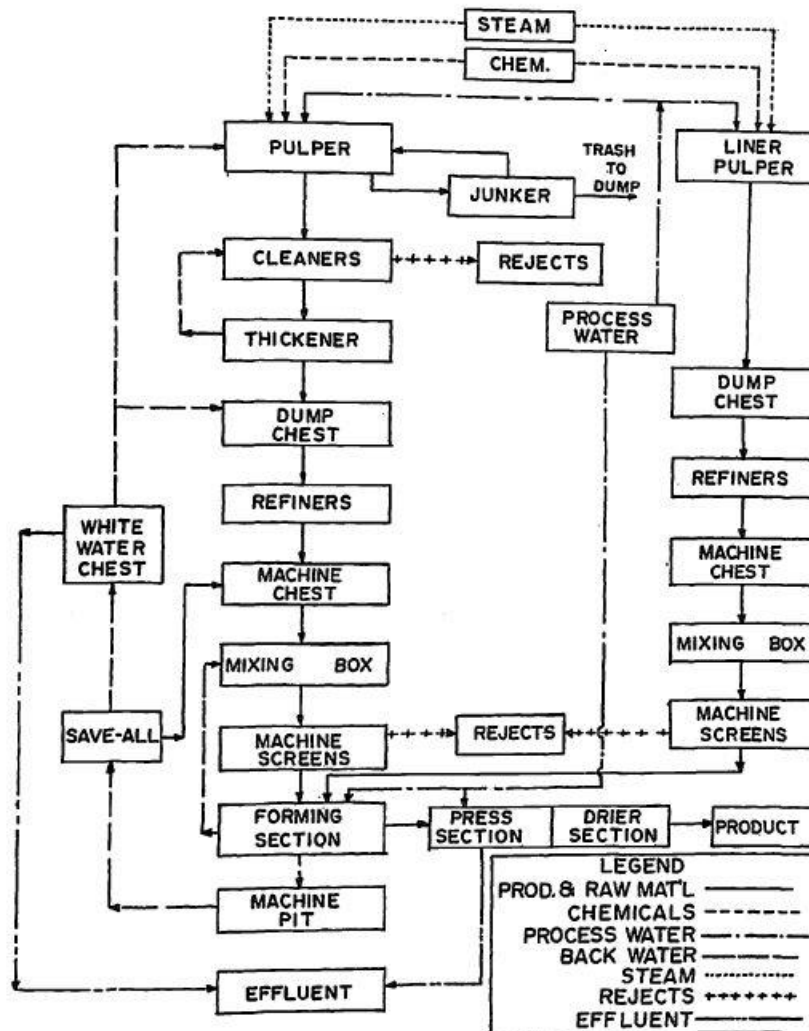
According to the publication, *State-of-the-Art Review of Pulp and Paper Waste Treatment*, prepared by Dr. Harry Gehm for EPA and dated April 1973, the Clifton Mill was categorized as a Waste Paper Board Mill by EPA (PAP-00102579). The following diagram shows the process of a typical Waste Paper Board Mill.

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FIGURE 37

**WASTE PAPER BOARD MILL
PROCESS DIAGRAM**



(PAP-00102568)

The initial breakdown of the waste paper involved mixing the waste paper with hot water in hydropulpers. The hot water softened the paper which made separation easier. After the hydropulpers, the materials were transferred to heavy-duty "beaters" that mechanically separated the paper fibers. After mechanical separation, the pulp was ready to be made into paper. This process involved the use of various paper making machines—e.g., foundriniers and cylinders. This process orients the fibers to make paper more or less stiff and involves drying, forming, and rolling the pulp into finished paper board. The wastewater from this process was sent to the Passaic Valley Sewerage Commission (PVSC) (PAP-00198586-87).

An Inventory and Appraisal dated August 1980 (1980 Inventory and Appraisal) in connection with WPBC's bankruptcy proceeding listed the following chemicals were listed as being at the Clifton Mill:

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WPBC Chemical List	
Quantity	Chemical
900 Pounds	Acc-Cyfor Drylite
1200 Pounds	Aluminum Paste
2000 Pounds	Aluminum Sulphate
400 Pounds	Alamask 308 DX
500 Pounds	Basic Brown TB
150 Pounds	Calco Nigro 02P
1000 Pounds	Calcocid Orange RR
1000 Pounds	Chrysodine Y
1700 Pounds	Lycoid 250
1760 Pounds	Paracol 802D
400 Pounds	Starch
1400 Pounds	Alum Sulph STD GRD Dry
500 Pounds	BA-11
1600 Pounds	Burolock
110 Gallons	Burn Rite
440 Pounds	Calgon NFL 25
120 Pounds	Flake Caustic Soda
9 Drums	Resin-HCR-5
200 Pounds	Sal Soda
450 Pounds	Santosite Sodium
800 Pounds	Felt Wash Dricid
500 Gallons	Mineral Spirits

(PAP-00102400)

According to the 1980 Inventory and Appraisal, the Clifton Mill site contained 52,000 gallons of No. 6 fuel oil, 500 gallons of No. 2 fuel oil, as well as five cartons of mercury and incandescent lamps (PAP-00198594, 97). The Inventory and Appraisal did not include any entries for bleaching equipment or bleaching chemicals (PAP-00102414-15; PAP-00102391-400; PAP-00198589-97).

According to a *Section 4M/6J Remedial Investigation Report Route 21 Freeway Extension*, dated 1995 (1995 Route 21 Report), a portion of the subject property had the Dundee Canal running adjacent to it. According to the report: A 1935 Sanborn Map of the canal shows the Clifton Paper Board Company had two "Acid Tanks" and a "Coal Pile" bordering the eastern shore of the canal. The coal pile is not visible in the 1940 aerial photograph (PAS-00114024). A 1961 aerial photograph showed that drums were stored adjacent to the Clifton Paper Board facility on the eastern shore of the Dundee Canal, and a 1974 aerial photograph showed that the drums present on the eastern shore of the canal in the 1961 aerial photograph had been removed and replaced by tractor trailers (PAS-00114025). Note: The sampling investigation for the 1995 Remedial Investigation occurred in the canal and not on the former Clifton Mill property or the Passaic River. In addition, the aerial photos and Sanborn maps referenced in the 1995 Route 21 Report were not attached to the report and have not been reviewed. The interpretation of the aeriels and Sanborn Maps was included in this report to describe facility operations.

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4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

Note: Detections of the COCs discussed below were obtained in connection with investigations and remedial actions under ECRA and ISRA by owners of the site after WPBC sold it in 1987. These subsequent owners (V. Ponte & Sons, Inc. and Recycled Paper Board, Inc.) are not related to WPBC and are not PAPs in this allocation process.

PCBs

According to undated results of EPA Priority Pollutant Volatile Compounds included in the 2006 PRP DEF, 2,100 µg/kg (2.1 mg/kg) of PCB-1254 was detected in soil sample No. VP/DS1 (PAS-00113687). Location of the sample was not identified in this report; however, sample VP/DS1 was cited in the HWEC Phase I soil cleanup report as being a post excavation sample that was located at the drum storage area on the west side of the building (PAS-00113518-19).

A February 1986 memorandum from NJDEP regarding its review of the July 25, 1985 Sampling Plan and February 4, 1986, Addendum stated that an inspector identified two transformers on the site and that documentation must be provided stating that they did not contain PCBs (PAS-00113605-7). A May 1988 report by HWEC in connection with ECRA-related sampling said that 3 soil samples were collected on May 18, 1988 at an interval of zero to six inches from the transformer area and tested for PCBs (PAS-00113523-4). The report summarized the PCB results as follows: "The total PCBs detected in the soil samples collected in the transformer area ranged from 0.05 mg/kg to 1.3 mg/kg. Since the NJDEP threshold level for total PCB's in soil is between 1 mg/kg to 5 mg/kg, excavation of these materials is not proposed." (PAS-00113525). An undated ECRA *Environmental Concern Tracking Sheet* identified the transformer area as a location of concern for potential PCB contamination, noted a PCB concentration of "1.3" and an action level of "5.0", and stated that the "outcome" was no further action required (PAS-00113602-3).

According to the *Remedial Investigation Report and Remedial Action Workplan (RIR/RAW) for the Property Known As Former Recycled Paperboard* and prepared by Environmental Waste Management Associates (EWMA) dated October 2007 (2007 EWMA RIR/RAW), during a January 27, 2006 site inspection by EWMA, three transformers were identified on the Property. It was determined that all three transformers did not contain PCBs. In addition, no staining or other evidence of discharges was noted in the vicinity of any of the transformers (PAP-00198528).

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PAHs

On March 22, 1989, Hazardous Waste Engineering Consultants (HWEC) on behalf of Recycled Paper Board of Clifton, Inc., ECRA Case No. 85193 submitted analysis results to NJDEP (PAS-00113531-541). The analytical results were from the soil testing around the abandoned drum storage area (PAS-00113531). Three grab samples were collected on November 29, 1988 on the west side of the structure. The results follow:

WP GS-1 (Depth 6-12 inches)	
Compound detected	Results micrograms/kilogram (µg/kg)
phenanthrene	130 J
anthracene	34 J
pyrene	220 J

J indicates that the compound was present in the soil sample, but the concentration is estimated as it is below the specified minimum detection limit.

(PAS-00113692; PAS-00113535, 541)

WP GS-2 (Depth 13-19 inches)	
Compound detected	Results µg/kg
naphthalene	590
phenanthrene	36 J
pyrene	26 J

J indicates that the compound was present in the soil sample, but the concentration is estimated as it is below the specified minimum detection limit.

(PAS-00113692; PAS-00113535, 541)

WP GS-3 (Depth 20-26 inches)	
Compound detected	Results µg/kg
naphthalene	34 J
phenanthrene	96 J
pyrene	120 J
benzo(b)fluoranthene	110 J
benzo(a)pyrene	6 J

J indicates that the compound was present in the soil sample, but the concentration is estimated as it is below the specified minimum detection limit.

(PAS-00113692-93; PAS-00113535, 541)

Undated results of EPA Priority Pollutant Volatile Compounds state that 150 (J) micrograms/kilogram (µg/kg) of benzo(a)anthracene and 450 µg/kg of pyrene were found in soil sample VP/DS1 (PAS-00113683-84). Location of the sample was not identified in this report; however, sample VP/DS1 was cited in the HWEC Phase I soil cleanup report as being a post-excavation sample that was located at the drum storage area on the west side of the building (PAS-00113518-19).

Dioxins/Furans

Sampling of soil and groundwater carried out in 2005 did not detect dioxins/furans in facility site soils (PAP-00198542-55).

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Copper

On March 22, 1989, HWEC on behalf of Recycled Paper Board of Clifton, Inc., ECRA Case No. 85193 submitted analysis results to NJDEP (PAS-00113531-541). The analytical results were from the soil testing on the soil around the abandoned drum storage area (PAS-00113531). Three grab samples were collected on November 29, 1988 on the west side of the structure and all samples were analyzed for Priority Pollutant Metals which included copper.

Copper		
Sample Number	Depth	Results mg/kg
WP GS-1	6-12 inches	27
WP GS-2	13-19 inches	705
WP GS-3	20-26 inches	147

(PAS-00113535, 541; PAS-00113699)

Undated results of EPA Priority Pollutant Volatile Compounds included in the 2006 PRP DEF stated that 2,440 mg/kg of copper was found in soil sample VP/DS1 (PAS-00113688). Location of the sample was not identified in this report; however, sample VP/DS1 was cited in the HWEC Phase I soil cleanup report as being a post excavation sample that was located at the drum storage area on the west side of the building (PAS-00113518-19).

Lead

On March 22, 1989, HWEC on behalf of Recycled Paper Board of Clifton, Inc., ECRA Case No. 85193 submitted analysis results to NJDEP (PAS-00113531-541). The analytical results were from the soil testing on the soil around the abandoned drum storage area (PAS-00113531). Three grab samples were collected on November 29, 1988 on the west side of the structure and all samples were analyzed for Priority Pollutant Metals which included lead.

Lead		
Sample Number	Depth	Results mg/kg
WP GS-1	6-12 inches	173
WP GS-2	13-19 inches	2,420
WP GS-3	20-26 inches	277

(PAS-00113535, 541; PAS-00113699)

Undated results of EPA Priority Pollutant Volatile Compounds included in the 2006 PRP DEF stated that 457 mg/kg of lead was found in soil sample VP/DS1 (PAS-00113688). Location of the sample was not identified in this report; however, sample VP/DS1 was cited in the HWEC Phase I soil cleanup report as being a post-excavation sample that was located at the drum storage area on the west side of the building (PAS-00113518-19).

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A *Remedial Action Report* (RAR) prepared by EWMA dated November 2016 (2016 EWMA RAR) stated that sixteen soil borings were installed at the Former Recycled Paperboard property on August 9, 2005, to investigate the gross leaching potential in areas where elevated lead concentrations had been previously detected in connection with investigation of historic fill on the property (PAP-00198429). Soil samples were collected for analysis from the layer of fill material in all sixteen of the borings installed on August 9, 2005. A review of analytical results from the August 9, 2005 of soil sampling event showed that total lead was detected at concentrations ranging from 467 ppm to 29,400 ppm (PAP-00198525). The analytical results stated that total lead concentrations ranged from 467 parts per million (ppm) to 29,400 ppm. The TCLP analysis method stated that concentrations of lead were detected at approximately 3 orders of magnitude less than the total lead analysis method (PAP-00198525). The leachability testing showed that the lead was very non-leachable, even under extreme acidic conditions of the test (PAP-00198524). The report concluded that although lead was detected at elevated concentrations at the property, the horizontal and vertical sampling showed that lead is contained in the layer of fill material at the property and not a result of previous on-site operations (PAP-00198429-30).

Groundwater samples collected in December 2005 exhibited lead concentrations above the GWQS in only one monitoring well, 11.2 µg/L in MW-3. Samples from the other 2 wells did not identify lead above the method detection limit (PAP-00198430). A confirmatory groundwater sampling round was conducted in December 2006. All samples exhibited lead concentrations that were non-detectable above the method detection level in all monitoring wells. Based on the two groundwater sampling rounds, EWMA concluded that lead contamination associated with the historic fill does not impact the groundwater conditions at the property (PAP-00198431).

Mercury

On March 22, 1989, HWEC on behalf of Recycled Paper Board of Clifton, Inc., ECRA Case No. 85193 submitted analysis results to NJDEP (PAS-00113531-541). The analytical results were from the soil testing on the soil around the abandoned drum storage area (PAS-00113531). Three grab samples were collected on November 29, 1988 on the west side of the structure and all samples were analyzed for Priority Pollutant Metals which included mercury.

Mercury		
Sample Number	Depth	Results mg/kg
WP GS-1	6-12 inches	Undetected
WP GS-2	13-19 inches	2.4
WP GS-3	20-26 inches	1.8

(PAS-00113535, 541; PAS-00113699)

Undated results of EPA Priority Pollutant Volatile Compounds included in the 2006 PRP DEF identified 2.9 milligrams/kilogram (mg/kg) of mercury in soil sample VP/DS1 (PAS-00113688). Location of the sample was not identified in this report; however, sample VP/DS1 was cited in the HWEC Phase I soil cleanup report as being a post-excavation sample that was located at the drum storage area on the west side of the building (PAS-00113518-19).

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Historic Fill

The Allocation Team has determined that the facility site is located on regional historic fill as designated by the NJDEP.

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.¹ Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.² PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of historic fill at varying levels, not atypically at or exceeding residential soil standards.³

Two excavations on the east side of the site building during an ECRA investigation in 1988 encountered significant historic fill material consisting of “bricks, concrete, cinders and metal intermixed with sand and gravel” at a depth of 10.5 feet (PAS-00113518). EWMA conducted subsurface investigation during July and August of 2005 under ISRA for the express purpose of determining the extent and makeup of fill material, which had been identified as an Area of Concern for the site (PAP-00198503, 521-528). A total of 33 soil borings were installed to investigate the presence of historic fill (PAP-00198521). Fill material consisting of ash, cinders, concrete and wood pieces was observed in each of 17 borings ranging from one foot to 12.5 feet thick (PAP-00198425, 429; PAP-00198521). The 2007 EWMA RIR/RAW, concluded as follows: “Based on the fact that only PAH compounds and metals were detected in soil at concentrations greater than their respective NJDEP MSSCC and since the contamination is concentrated within the fill layer, EWMA considers the elevated PAH and metals in soil to be a result of the fill material on the subject site and not a result of former operations conducted at the site.” (PAP-00198523).

The 2016 EWMA RAR noted that historic fill was discovered on the property during the removal of four underground storage tanks in 1988 (PAP-00198429). Later investigations performed in 2005 determined that the fill material ranged from “one foot thick to 12.5 feet thick in certain areas.” (PAP-00198429).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00198481).

¹ *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

² New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

³ NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	94,800 mg/kg
Copper	7,880 mg/kg
Mercury	52.7 mg/kg
Benzo(a)anthracene	5.04 mg/kg
Benzo(a)pyrene	4.7 mg/kg
Benzo(b)fluoranthene	3.8 mg/kg
Benzo(k)fluoranthene	3.56 mg/kg
Dibenzo(a,h)anthracene	1.34 mg/kg
Indeno(1,2,3-cd)pyrene	2.67 mg/kg

The maximum detected concentrations of all COCs listed above were found to be associated with historic fill at the site as determined by a Licensed Site Remediation Professional (LSRP) pursuant to ISRA after extensive investigation of fill material at the site in 2005 (PAP-00198550; PAP-00198553; PAP-00198554; PAP-00198549).

Due to the presence of lead, mercury, and copper, related to historic fill above their respective NJDEP soil standards, restricted land use and engineering controls were implemented in a Deed Notice (PAP-00198447). NJDEP approved the Deed Notice to address the contamination in the historic fill. The Deed Notice was recorded on April 4, 2016 (PAP-00198488-97).

A 1931 aerial photograph shows that there are structures in existence at the Clifton Mill site 1931, two years before WPBC's predecessor acquired it in 1933 (PAP-00374506).

There is no indication from a review of provided documents that WPBC facility operations disturbed contamination located in historic fill.

5. COC Pathways

Direct Release

According to the 2006 PRP DEF, the following releases occurred at the Clifton Paper Mill, during the time periods of Clifton Paper Board Company and WPBC.

- In February, May, July and September, 1947, PVSC stream contamination reports documented Clifton Paper Board Company, at 1 Ackerman Ave., Clifton, New Jersey, was discharging industrial waste consisting of paper pulp, oily industrial waste liquid, and paper waste board into the Passaic (PAS-00113923, 925, 927, 929). These events are discussed in more detail in the Violations section of Section 6, below.
- According to a New Jersey Department of Health Field Information Report from 1971, a 12-inch pipe of unknown origin was discharging from WPBC into the Passaic River. The report states that the pipe was located near an unspecified bridge.

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- According to a New Jersey Department of Health Field Information Report from 1972, a 10-inch pipe of unknown origin was discharging from WPBC via the bulkhead into the Passaic River. The report notes that the “entire area was steaming from hot water.” (PAS-00113429).
- The facility discharged to the Passaic River pursuant to five National Pollution Discharge Elimination System (NPDES) permitted outfalls for some period during facility operations and ceasing in 1977. Outlet 002 was used for filter backwash and Outlet 004 for boiler blowdown. The use of the other outlets was not identified in the report (PAS-00113566-67). See also the Violations section of Section 6, below.

Sanitary and Storm Sewer

WPBC stated in their March 1985 *NJDEP ECRA General Information Submission* that the industrial facility discharged to the Passaic Valley Sewage Authority (PVSA) [sic] system (PAS-00113609).

According to the 2006 PRP DEF, the City of Clifton sanitary sewer line runs south on Ackerman Avenue, then east on Randolph Avenue. The line then runs south on Highland Avenue before it empties into the PVSC Trunk Line (PAS-00113432).

Spills

In January 1948, PVSC documented Clifton Paper Board Company had an incident with a discharge consisting of pulp waste and sewage into the Passaic River. The discharge was due to a slightly open by-pass valve (PAS-00113931) and was eliminated immediately by the facility by closing the valve tightly.

On October 3, 1949, PVSC reported that a flood in the heater room at Clifton Paper Board caused wastes to be discharged to the river. It was reported that “the waste was diverted to their by-pass and into Passaic River due to an electrical failure and the issue was repaired and eliminated.” (PAS-00113933).

On March 2, 1956, a mixture of oil and water flowing out of a 16-inch pipe was observed on Clifton Paper Board Company property. The flow was coming out of a flap valve and discharging into the Passaic River from the Clifton Paper Board Company property. It was discovered that the pipe was clogged which prevented the flow from going into the sanitary sewer. The clog was removed which remedied the situation that same day (PAS-00113935).

On December 18, 1956, there was a small oil slick flowing from a 14-inch pipe into the Passaic from the Clifton Paper Board Company property. The pipe had a flap valve attached to it with a wooden wedge keeping the valve open. The superintendent was notified, and he stated that the pipe was used to drain rainwater from the loading area and that the oil was from trucks parked there. He was unable to provide an explanation for the wedge, and it was removed and the issue was corrected (PAS-00113937).

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On August 8, 1969, WPBC was informed that they had a leak in the 20-inch steel pipeline carrying waste to the trunk sewer causing a small amount of pollution to reach the Passaic River. PVSC wrote a letter to WPBC asking the company to fix the line and received a response from WPBC that it would replace the entire line while company employees were on strike. . During the strike, no material would be in this line and therefore there would be no pollution. The repair was made by August 21, 1969 and all sources of potential pollution had been eliminated (PAS-00113559-60).

On December 29, 1969, a sanitary sewer line underneath a sidewalk broke, allowing industrial waste to enter into a catch basin that flowed into the Passaic River. The plant was shut down with the discovery of this break and repairs were made before the plant reopened on January 5, 1970 (PAS-00113560).

On June 1, 1977, WPBC called to advised the PVSC that a ¾-inch cleanout cap had blown off the 20-inch company force main and discharged sewage to the Passaic River. All operations in the plant were stopped. A new cap was installed, and the plant was back in operation the same day (PAS-00113563).

A review of available documents did not provide information regarding the volume or constituents of any discharges or spills to the Passaic River, with the exception of the 1976 outlet discharge exceedances described in the Violations section of Section 6, below. However, the PVSC reports for the incidents described above state that releases to the Passaic were of short duration.

6. Regulatory History/Enforcement Actions

Inspections

During a January 27, 2006, site inspection when the facility was owned by an unrelated third party, EWMA identified three transformers on the property. One transformer was located on the eastern side of the building on the property and the remaining two were located on the western side of the building. EWMA stated that the transformer on the eastern side of the building was installed in the last three years and did not contain PCB fluids. The remaining two transformers on the western side of the building had been refurbished within the last three years and had never contained PCB fluids. All three of the transformers were located over competent concrete within fenced-in enclosures. No staining or other evidence of discharges was noted in the vicinity of any of the transformers (PAP-00198528).

Violations

In 1947, PVSC stream contamination reports documented four incidents of discharge from Clifton Paper Board Company, at 1 Ackerman Ave., Clifton, New Jersey, into the Passaic. The February incident involved paper pulp being discharged. This was caused by the failure of the main pump occurring over the weekend and the smaller reserve pump not being able to handle the total load. The issue was fixed within a day of the inspection (PAS-00113923). The May report involved industrial paper pulp due to a valve not being closed fully; the report states the valve was closed thus resolving the violation (PAS-00113925). The July report involved an oily discharge

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from a partly open valve, which was corrected after notification by the inspector (PAS-00113927). The September report involved paperboard discharge intended for the sanitary sewer due to an electrical breakdown in the main sewer pump which was corrected "within the hour" (PAS-00113923, 925, 927, 929).

In March and December 1956, Clifton Paper Board received violations for oil and water discharges from a pipe, described in the Spills section of Section 5, above (PAS-00113935; PAS-00113937). The violations were eliminated on the next day in March and on the same day in December.

On June 1, 1977, WPBC called to advise the PVSC that a ¾-inch cleanout cap had blown off the 20-inch company force main and discharged sewage to the Passaic River. All operations in the plant were stopped. A new cap was installed and the plant was back in operation the same day. This eliminated the violation (PAS-00113563).

In September 1976, PVSC notified WPBC that they had two of five outlets (002 and 004) were above values that PVSC did not consider acceptable for discharge limits into the Passaic River for suspended solids, turbidity, and pH, none of which are COCs. WPBC was advised to connect the outlet to the sanitary sewer for permit compliance or treat the effluent before discharge. WPBC determined they would pipe the discharge into the sanitary sewer temporarily, but recycle the water in the future (PAS-00113566). Lines for boiler blowdown (discharge outlet 004) were installed on March 12, 1977, and the discharge to the Dundee Canal was eliminated. After taking five months to receive the pump from the vendor, discharge outlet 002 (filter backwash) was fixed by October 1977 (PAS-00113567). It is noted that flow from the filter backwash was polluting suspended solids and turbidity for approximately 10 minutes at 9:00 a.m. and 1:00 a.m. each day, and the flow was estimated at 300 gallons per minute. Outside of those times, the discharge was non-polluting (PAS-00113566-67).

Permits

The Facility discharged to the Passaic River pursuant to five National Pollution Discharge Elimination System (NPDES) permitted outfalls for some period during facility operations and ceasing in 1977. Outlet 002 was used for filter backwash and Outlet 004 for boiler blowdown. The use of the other outlets was not identified in the report (PAS-00113566-67).

On November 7, 1980, EPA sent a letter to WPBC regarding NPDES Application Permit No. NJ0001457. Upon review of application documents, EPA determined that a NPDES permit may not be necessary since the company was bankrupt and the plant was shut down (PAP-00374507).

An NJDEP ECRA General Information Submission was issued in March 1985 that was triggered by the agreement of sale between WPBC and Ponte. It stated that WPBC did not have a New Jersey Pollutant Discharge Elimination System permit at the time (PAS-00113609, 612). Note: The Clifton Mill had been shut down since April of 1980 (PAS-00113953, 961).

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Copies of the above-described permits were not available for review for this report.

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility. These documents were prepared in connection with investigations of the subject facility under ECRA and ISRA conducted by subsequent owners of the Clifton Mill facility – V. Ponte & Sons and Recycled Paper Board – that are not related to WPBC. However, these documents are relevant because they evidence site conditions, including the absence of COCs in site soils from WPBC operations at the facility and the existence of COCs in historic fill on the site. These reports provide evidence that there were no potential or known off-site migration of contaminants during WPBC's period of ownership from 1933 to 1987.

- *Final Report of Site Remedial Activities* of WPBC NJDEP- ECRA Case No. 85193 for Recycled Paper Board of Clifton, NJ dated January 11, 1991 (PAS-00113481).
- *Preliminary Assessment/Site Investigation Report* completed in May 2006 (PAP-00198427). This document was not available for review but was referenced in the November 2016 *Remedial Action Report*, listed below.
- *Remedial Investigation Report/Remedial Action Workplan* for Property known as Former Recycled Paperboard, 1 Ackerman Ave., Clifton, NJ dated October 2007 (PAP-00198498).
- *Remedial Action Report* Former Recycled Paperboard, dated November 2016 (PAP-00198421).

Soil

A February 24, 1986, a NJDEP internal memorandum (1986 NJDEP Memorandum) cited six areas of concern after the review of the July 25, 1985, Sampling Plan and its February 4, 1986, Addendum plus a NJDEP site inspection report of October 2, 1986:

- Tank 1, a 1,000-gallon underground tank containing mineral spirits
- Tank 2, a 3,000-gallon underground tank containing mineral spirits
- Tank 3, a 4,000-gallon underground tank containing hydraulic oil
- Tank 4, a 1,000-gallon underground tank containing No. 2 fuel oil
- Stained soils at the fill line for an aboveground 160,000-gallon No. 6 fuel oil tank
- Stained soils in the drum storage area (PAS-00113605)

According to the 1986 NJDEP Memorandum, petroleum hydrocarbon contamination of soils in excess of 100 ppm had been identified at all of the underground tank storage areas and the stained soil at the aboveground storage tank and drum storage area had not been sampled and analyzed. The memorandum recommended that NJDEP require these areas to be addressed further in the Sampling Plan (PAS-00113605-07).

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In December 1986, NJDEP issued an Administrative Consent Order (1986 ACO) for NPN, Inc. and WPBC, ECRA Case 85193. This ACO was entered in connection with NPN, Inc.'s acquisition of WPBC stock, which triggered ECRA obligations. The ACO required NPN, Inc. to submit a complete delineation of environmental contamination onsite and any off-site environmental contamination resulting from discharges of hazardous wastes or substances on or from the property (PAS-00113660-68). WPBC subsequently sold the Clifton Mill to an unrelated third party, V. Ponte & Sons on October 1, 1987 (PAP-00102234 –0102242).

By letter October 8, 1987, attorneys for Ponte notified NJDEP that Ponte assumed responsibility for achieving ECRA compliance at the Clifton Mill facility at 1 Ackerman Ave in accordance with the 1986 ACO (PAS-00113513-14). Ponte assured NJDEP they would assemble the technical information and prepare an implementation schedule in a timely fashion (PAS-00113513-14). Ponte thereafter completed the ECRA process which consisted of the investigation and remediation, where necessary, of the 6 areas of concern noted in the 1986 NJDEP Memorandum. NJDEP issued a No Further Action determination letter on February 27, 1991, stating that cleanup of ECRA Case 85193 was completed and that the site was considered to be in full compliance with ECRA (PAP-00198509; PAP-00102547).

According to the 2007 EWMA RIR/RAW, characterization activities conducted in connection with ECRA Case 85193 included four underground storage tanks (containing mineral spirits, hydraulic oil and No. 2 fuel oil), stained soil beneath a fill pipe of a 160,000-gallon aboveground No. 6 fuel oil storage tank and stained soil in a drum storage area (PAP-00198508-19). The 2007 EWMA RIR/RAW noted that the consultant conducting the work under ECRA Case 85193 (HVEC) concluded that elevated concentrations of total petroleum hydrocarbons (TPHC) were due to the presence of fill material and not the result of a discharge from the former USTs. (PAP-00198511-12).

According to the 2007 EWMA RIR/RAW, EWMA completed the PA/SIR in May 2006. The 2006 PA/SIR was submitted to NJDEP in conjunction with the Former Recycled Paperboard facility, ISRA Case E20050496, which had ceased operations at the facility in 2005. (PAP-00198424).

The 2006 EWMA PA/SIR investigated nine AOCs of which the following six were recommended for No Further Action:

- AOC 1: Above Ground Storage Tanks
- AOC 3: Silo
- AOC 4: Above Ground Piping
- AOC 5: Former Drum Storage Area/Hazardous Material Storage
- AOC 8: Transformers
- AOC 9: Loading/Unloading Area/Railroad Spur (PAS-00198502)

The 2006 EWMA PA/SIR identified three AOCs that required further investigation. They were AOC 2: Underground Storage Tanks; AOC 6: Piping Trenches; and AOC 7: Historic Fill (PAP-00198502-503). The 2006 EWMA RIR/RAW documented the investigation into these three AOCs and provided recommendations if further action was

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necessary under the New Jersey Technical Requirements for Remediation (PAP-00198502). With respect to the underground storage tanks (AOC 2) EWMA requested that a no further action determination be issued based on the facts that impacted soils had been removed from the vicinity of the former underground tanks, that TPHC concentrations were determined to be the result of fill material (not releases from the tanks) and that NJDEP had issued a NFA determination for the tanks in February 1991 (PAP-00198512, 14, 16, 17). EWMA also requested a no further action determination for the piping trenches based on the results of an inspection of the trenches that showed they were intact with no holes, cracks or breaches (PAP-00198520).

EWMA conducted soil and groundwater of the property to investigate AOC 7 (Historic Fill) (PAP-00198521-28). The investigation consisted of 33 soil borings - 17 throughout the site in July 2005 and 16 more in August 2005 in areas where the results from the July borings were elevated for lead. The investigation also included groundwater testing of five monitoring wells and an additional 2 rounds of groundwater testing from 3 wells to further evaluate the impact of lead in the fill material. Analytical results of soil and groundwater testing stated that several contaminants typically associated with historic fill were present in soil and groundwater at the facility. EWMA summarized the investigation results as follows: "The results of the Preliminary Assessment and Site Investigation sampling conducted to date have not revealed any on-site sources of contamination other than historic fill that has been identified at the site. Sampling of the fill material has revealed concentrations of PAHs and metals that exceed the NJDEP MSSCC. Fill material is generally present throughout the site at depths ranging from site grade to approximately 12.5 feet...Based on the two groundwater sampling rounds, EWMA has concluded that lead contamination is associated with the historic fill and does not impact groundwater conditions at the Property." (PAP-00198528). The 2016 EWMA RAR stated: "Based on the fact that only PAH compounds and metals were detected in soil at concentrations greater than their respective NJDEP RDCSCC and since the contamination is concentrated in the fill material, EWMA considers the elevated PAH and metals in soil to be the result of the fill material on the Property and not a result of former operations conducted at the Property- (PAP-00198429). Note: The PA/SIR discussed above was not included in the documents provided for review of this Data Facility Report. Instead, the above information was obtained from the November 2016 RAR.

Groundwater

By letter of March 22, 1989, regarding Recycled Paper Board ECRA Case No. 85193 to NJDEP, HWEC reported the results of groundwater samples collected in November 1988 from five groundwater monitoring wells that were installed at the former Recycled Paper Board facility in 1986. In addition to the sampling of these wells, HWEC conducted a "half-mile radius well search." The study of the half-mile well search revealed 46 groundwater supply and groundwater monitoring wells installed in the vicinity of the facility that had Petroleum Hydrocarbon odors in their water. Of the 46 wells listed in the search, at least ten have recorded in their installation logs the detection of a gas, oil or petroleum hydrocarbon odor. One such well installation record from a gas station, located up-gradient to the Recycled Paper Board facility, stated there were very strong petroleum hydrocarbon vapors at 15 to 22 feet below grade. Another

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site upriver from Recycled Paper Board recorded in the monitoring well installation log that there was a strong solvent odor during installation of the wells (PAS-00113533).

HWEC stated that based on the groundwater contours developed for this report there was a southeastern flow of groundwater and that according to the groundwater elevations, MW-1 served as the background well (PAS-00113533). The monitoring well MW-1 is located along the western property boundary which is up-gradient with respect to the site's easterly groundwater flow direction (PAP-00198426).

HWEC concluded that all relevant information showed the groundwater contamination detected in the monitoring wells is similar to that detected in the background well, MW-1. HWEC concluded that the detected groundwater contamination at the Recycled Paperboard facility "is from an off-site location and not from soil contamination on the property", so further remediation should not be required (PAS-00113533).

The 2007 EWMA RIR/RAW report by ~~EWMA~~ stated that soil boring activities in July, August and December of 2005 encountered groundwater at depths ranging from 7 to 14 feet below ground surface (bgs). Based upon the groundwater elevation, data recorded from the monitoring wells, which were installed during the historic fill investigation, groundwater was noted to flow in the easterly direction across the site, which corresponds to the topography and flow of the Passaic River (PAP-00198504). As noted above, the 2005 investigation by EWMA determined that groundwater exceedances of PAHs and metals were attributed to historic fill (PAP-00198425). In addition, lead contamination associated with the historic fill did not impact groundwater conditions at the property (PAP-00198531).

Remedial Activities

By a letter dated May 24, 1988, Ponte's consultant, HWEC, notified NJDEP they had completed the Phase I soil cleanup program initiated for WPBC under ECRA Case Number 85193 (PAS-00113516). Areas of environmental concern included in the soil cleanup program were a 1,000 and a 3,000-gallon mineral spirits tanks; a 4,000-gallon hydraulic oil tank; a 1,000-gallon fuel oil tank; a 160,000-gallon aboveground fuel oil storage tank; and the former drums storage area (PAP-00113516-17). These were the 6 Areas of Concern identified in the 1986 NJDEP Memorandum (PAS-0113605). Approximately 1,180 cubic yards of Petroleum Hydrocarbons-contaminated (PHC) - soil was excavated and removed from these areas in May 1988 (PAS-00113516-17).

Underground Storage Tanks

Excavation No. 1 was associated with the former 1,000-gallon mineral spirits tank on the northeast side of the site building (PAS-00113516, 26). The final depth of the excavation was measured at about 14.5 feet bgs (PAS-00113517; PAP-00198512). Post-excavation soil samples were collected from 3 locations within the excavation and the analytical results for TPHCs ranged from 5 mg/kg to 18 mg/kg (PAS-00113519-20; PAP-00198512).

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Excavation No. 2 was associated with the former 3,000-gallon mineral spirits tank on the east-central side of the building. (PAS-00113516, 27; PAP-00198573; PAP-00198514) The depth of the excavation was 10.5 feet and fill material was noted to 10.5 feet (PAP-00198514). Eight post-excavation soil samples were collected from within the excavation and samples submitted for TPHC analysis. Detected TPHCs ranged from 45 mg/kg to 674 mg/kg (PAP-00198514). HWEC conducted a sieve analysis on a representative sample of fill material and concluded that the elevated concentrations of TPHC were due to the presence of fill material in the excavation and not the result of a discharge from the former UST (PAS-00113518; PAP-00198515, 17).

Excavation No. 3 was associated with the former 4,000-gallon hydraulic oil UST on the southeast side of the site building (PAS-00113528; PAP-00198516; PAP-00198573). The depth of the excavation was 10.5 feet bgs (PAS-00113518, 28). Materials encountered during the excavation were considered fill and consisted of bricks, concrete, cinders and metal intermixed with sand and gravel (PAS-00113518). Post-excavation soil samples were collected from 8 locations within the excavation and analyzed for TPHC. Detected TPHC ranged from 48.7 mg/kg to 411 mg/kg (PAS-00113520-21; PAP-00198516). HWEC conducted a sieve analysis on a representative sample of fill material and concluded that the elevated concentrations of TPHC were due to the presence of fill material in the excavation and not the result of a discharge from the former UST (PAP-00198517).

Excavation No. 4 was associated with the former 1,000-gallon No. 2 fuel oil tank on the northwest side of the building (PAS-00113517, 29; PAP-00198511; PAP-00198573). The depth of the excavation was 8 feet bgs (PAS-00113518; PAP-00198511). Fill material was noted to 8 feet bgs (PAP-00198511). Four post-excavation soil samples were collected within the excavation and analyzed for TPHC. Analytical results for TPHC ranged from 55.3 to 2,990 mg/kg. Vapor analyzer screening of the same sample that had the concentration of 2,990 mg/kg showed a concentration of less than 100 mg/kg. Examination of the non-odorous material revealed blackish pieces of unburned coal like material mixed in the sandy soil (PAS-00113522). HWEC conducted a sieve analysis on a sample of fill material within the excavation and concluded that the elevated concentrations of TPHC were due to the presence of fill material (including coal/unburned cinders) in the excavation and not the result of a discharge from the former UST (PAS-00113522-23; PAP-00198511-12).

Drum Storage Area

Excavation of impacted soil at the drum storage area on the west side of the building could not be completed during the May 1988 excavation activities because a concrete pad was encountered along the building wall at a depth of 12 inches (PAS-00113518). A sample (Sample No. VP-DS1) was collected at a depth of 12 inches below the surface along the edge of the concrete and analyzed for PP+40 and PHC (PAS-00113519). The PHC result was 1,340 mg/kg and HWEC determined that additional excavation in this area would be necessary. Soil was removed from the drum storage area to a depth of 4 feet bgs on October 31, 1989 PAS-00113485; PAP-00198518). Four post-excavation samples were collected at depths ranging from 13 inches to 19 inches below grade. The post excavation samples were analyzed for total PAHs, PCB's, BN+15, antimony, cadmium, copper, mercury, and zinc. The analytical results from these analyses stated

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that the level of compounds detected in the post-excavation samples were below the respective NJDEP soil action levels (PAS-00113485; PAP-00198519). PCBs were non-detect (PAP-00198519).

160,000-gallon Aboveground No. 6 Fuel Oil Storage Tank

The excavation of impacted soil beneath the fill pipe of the 160,000-gallon aboveground No. 6 fuel oil storage tank (AST) could not be completed during the May 1988 excavation activities because groundwater was encountered at seven inches bgs (PAS-00113518). HWEC determined that further excavation and testing was needed for the area of the AST (PAS-0011351818). The AST was located on the southwest side of the site building (PAP-00198573). Between October 31, 1989 and August 1990, the stained soil was excavated from around the fill pipe of the AST (PAS-00113485-86). Post excavation samples were collected and analyzed for PHCs content after each excavation. The report did not state the depth of the samples taken only that each time more soil was excavated. By July 13, 1990, 26 cubic yards of soil had been excavated. The following is a breakdown of the series of sampling events results.

- October 31, 1989 PHCs ranged from 572 mg/kg to 1,380 mg/kg
- December 22, 1989 PHCs ranged from 271 mg/kg to 1,150 mg/kg
- January 30, 1990 PHCs ranged from 270 mg/kg to 2.920 mg/kg
- June 29, 1990 PHCs ranged from 16 mg/kg to 301 mg/kg
- July 13, 1990 three post-excavation samples were taken for the final post excavation sample analysis. Surficial water was encountered at 5 feet bgs therefore a base sample could not be collected. Three sidewall samples were taken 0" to 6" intervals above water level. One sample detected PHCs at 182 mg/kg.
- On August 17, 1990, three additional excavation samples were taken at the same location as the July 13, 1990 sampling.
- August 22, 1990 half a cubic yard of soil was excavated due to the July 13, 1990 sample result of 182 mg/kg (PAS-00113485-87).

The level of lead detected in the site soils that were excavated from the drum storage area and from beneath the fill pipe to the AST was slightly above the RCRA threshold level and classified the soil as a RCRA hazardous waste. The lead was detected at 5.02 ppm and 5.08 ppm (PAS-00113491).

The results from the post-excavation sample analysis stated that the highest detected level of lead was 14 µg/kg (ppb). Almost equal levels of lead were detected in each area during the waste classification analysis, thus indicating that the level of lead is characteristic of the site soils. Similarly, the detected level of lead in the post-excavation samples collected from the drum storage area can be assumed to be characteristic of the site soils (PAS-00113491).

On February 27, 1991, NJDEP issued a Full Compliance Letter for the WPBC facility stating that the Clean-up Plan dated October 21, 1989 had been implemented and completed for ECRA Case Number 85193 (PAP-00102547).

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According to the 2016 EWMA RIR/RAR, on April 13, 2015, four soil borings (SB-I to SB-4) were installed on the southern portion of the property to evaluate the subsurface conditions in the area under the former 160,000-gallon No. 6 Fuel Oil AST within AOC-1 (PAP-00198437-38). The boring depths were 20 feet bgs. Historic fill material was encountered in all borings on the Property ranging in depth from site grade to as deep as 12.5 feet below surface grade. This fill material consisted of ash, cinders, crushed brick, concrete and wood pieces followed by sandy silt and clay (PAP-00198438).

The soil samples taken from the soil borings were visually inspected and screened using a Mini-RAE 2000 PID for the presence of total volatile organic compounds (VOCs). Soils were also examined for evidence of free product contamination, discoloration or odors. There was no indication of organic vapors or contamination or discharge. Therefore, samples were not submitted for analysis (PAP-00198437-38). EWMA concluded that soils beneath the former AST were not impacted by any discharge or spill from the AST (PAP-00198447).

According to the 2016 EWMA RAR, based on the presence of contaminants related to historic fill (AOC 7) above their respective NJDEP soil standards, a Deed Notice and engineering controls (i.e., surface cap) was filed with the Passaic County Clerk on April 4, 2016. The surface cap over the entire Property is to prevent exposure to the contaminants of concern (PAP-00198444).

8. Summary of Asserted Defenses

Neu Holdings asserts the “Respondent denies that WPBC released COCs from its operation of the Clifton Plant to the Passaic River and OU 2. Even if it did, WPBC’s liability for any such releases was discharged as a matter of law in bankruptcy on March 31, 1981. On February 8, 1980, WPBC commenced a voluntary proceeding under Chapter 11 of the United States Bankruptcy Code, 11 U.S.C. §§101 et seq. (the “Bankruptcy Code”) in the United States Bankruptcy Court for the District of New Jersey (the “Bankruptcy Court”), said proceedings having been designated In re Whippany Paper Board Co. Inc., Case No. 80-00426”. USEPA was aware at the time of WPBC’s bankruptcy proceedings and had an opportunity to participate in the same.

On March 31, 1981, the Bankruptcy Court entered an Order confirming WPBC’s reorganization plan. Per the plan of reorganization and the bankruptcy code, the confirmation of the reorganization plan discharged WPBC from any and all “debts that arose before the date of such confirmation.” (PAP-00102386)

“USEPA has suggested that the bankruptcy discharge does not pose a barrier to USEPA’s claim because the bankruptcy discharge occurred long before EPA initiated a response action at the Diamond Alkali Site. However, the Bankruptcy Code Section 101(5) defines a “claim” to include a right to payment that at the time of a debtor’s bankruptcy remains “unmatured” and/or “contingent,” and it is well-established that a potential liability may qualify as a “claim” for bankruptcy discharge purposes even if it has not yet fully accrued into a cognizable cause of action under applicable non-bankruptcy law. 1 Collier on Bankruptcy, 101.05 at 101-39 (16th Ed. 2017) (As defined in the Bankruptcy Code, the term “[c]laim” . . . include[s] a cause or action or right to payment that has not yet accrued or become cognizable.”). In the environmental

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context, a Chapter 11 bankruptcy debtor may be discharged from any and all potential liabilities related to a pre-confirmation release or threatened release of hazardous substances even if such release does not become the subject of any investigation and/or resulting response costs until several years (or even decades) after the debtor's Chapter 11 plan has been confirmed.

"In this case, WPBC ceased operating the Clifton Plant in April of 1980, before the March 31, 1981 confirmation of its Chapter 11 Plan and never resumed operation of the Clifton Plant before selling it to V. Ponte & Sons on October 1, 1987 (PAS-00113953). Accordingly, even if WPBC's operation of the Clifton Plant resulted in the release of COCs into the Passaic River (of which there is no evidence), the liability of WPBC for any such release was discharged upon the court's confirmation of its Chapter 11 Plan".

Evidence shows that the Clifton Plant operations during the period of WPBC's ownership and operation did not include COCs and that the Clifton Plant property was not a conduit for discharging COCs into the River. As such, the former Clifton Plant, which is located nearly nine miles from OU2, did not discharge COCs that could have had any material impact to the Passaic River or OU2. Especially considering that Neu Holdings' wholly-owned subsidiary contributed approximately \$1.8 million toward lower Passaic River investigation and a removal action for which it had no responsibility at all, Neu Holdings should bear no further liability for the Diamond Alkali Site or OU2.

Neu Holdings also asserts the following defenses to liability that will be set forth in more detail in its position papers: (i) the petroleum exclusion, (ii) the permitted discharge defense, (iii) that any releases of COCs from the site occurred when the facility was owned/operated by others before or after WPBC (i.e. Ponte and/or Recycled Paper Board), and/or (iv) liability for the Lower Passaic River Site is the responsibility of Ponte, who expressly assumed and notified NJDEP of its environmental responsibility for the former Clifton Mill. (PAS- 00113513-14) Neu Holdings reserves the right to assert other defenses to liability and raise other accompanying litigation risks.

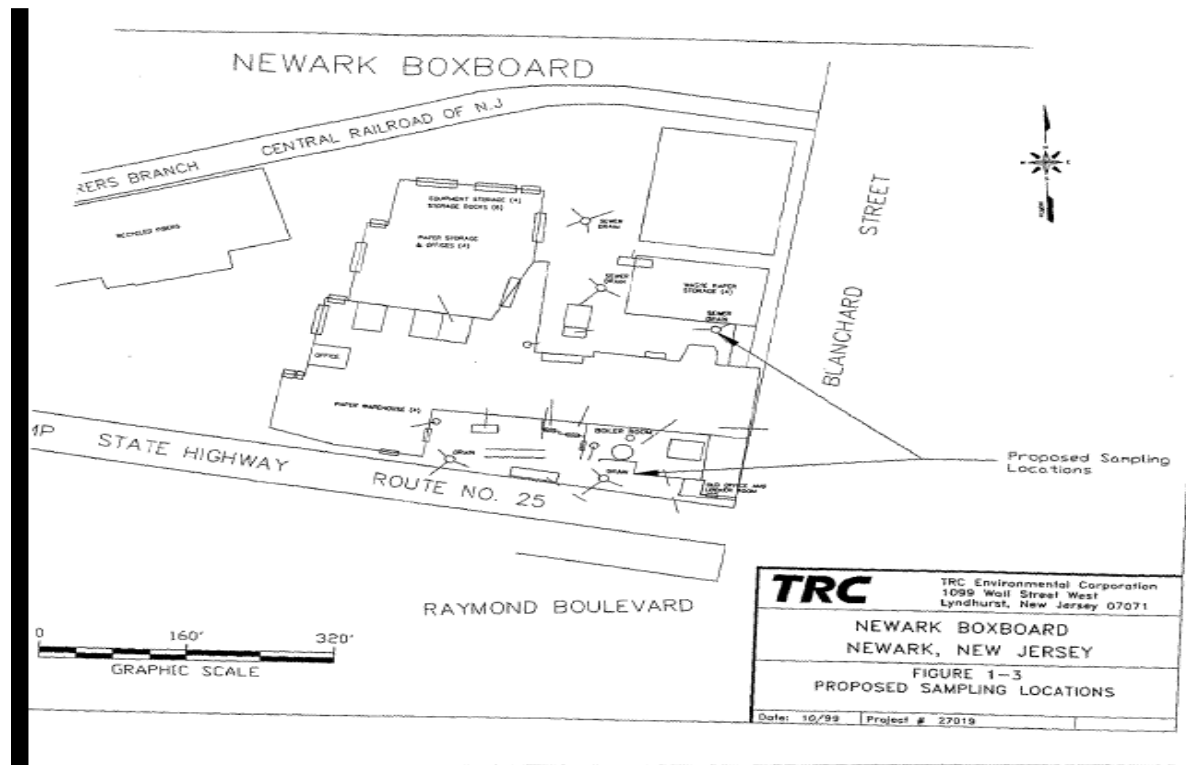
The Newark Group, Inc.

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NEWARK GROUP, INC.

Facility Name, Address and Size: Newark Boxboard/Newark Boxboard Company, Inc./Newark Boxboard Company; 17 Blanchard Street, Newark, New Jersey. (PAP-00114815; PAS-00000432). 150 employees reported in 1978, manufacturing 24 hours per day, 6-7 days per week (PAS-00000432). In 2003, it was reported that the facility employed 45 hourly employees and approximately 12 other employees (PAS-00004277). The acreage of the facility is approximately 7 acres (PAP-00352934; PAP-00114812). See the following figure for location of facility.



(PAP-00352940)

1. **Business Type:** Paperboard manufacturer through the recycling of wastepaper (PAS-00000432; PAS-00103684).
2. **Time Period of Ownership/Operations**

Operator: 1912/1913 to 2003 (PAP-00114815-16; PAS-00123408)

Owner: 1912 or 1968 to March 28, 2013 (PAS-00004272; PAP-00352946-49)

According to a Site History section of the *Remedial Investigation Report with LNAPL Interim Remedial Measures Report*, dated November 2016, the site was operated by Newark Board Paper Mills from approximately 1892 to approximately 1908, then by George W. Downs Company Paper Mill from approximately 1908 to 1912 with Newark

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Boxboard beginning operations in 1912 (PAP-00114815-16; PAP-00352928-29). Note: The *Response of The Newark Group, Inc. to the USEPA Request for Information*, dated April 2003 (Response to Request for Information) described The Newark Group's ownership as "1968 to 'present'" (PAS-00004272). There is no documentation available to state that the operations of Newark Board Paper Mills or George W. Downs Company Paper Mill are affiliated with Newark Boxboard.

Newark Boxboard was incorporated as a New Jersey corporation on April 10, 1912 (PAP-00428161).

According to the Response to Request for Information, The Newark Group purchased the Newark Boxboard facility from R.W. "Dick" Lewis on September 13, 1968 (PAS-00004277; PAS-00076564). From 1940 to 1968, the facility was owned and operated by Margaret Lewis and R.W. "Dick" Lewis; neither being related to The Newark Group (PAS-00004277).

The Newark Group, Inc. is the successor to Newark Group Industries, Inc., which is the successor to the Newark Boxboard Company (PAS-00004278).

On March 28, 2013, The Newark Group, Inc. conveyed the property to 60 Lockwood Associates, LLC (PAP-00352946-49).

3. Operational History/COC Use and Presence at the Facility

The Newark Boxboard facility produced recycled paperboard in various caliper ranges. The facility recycled approximately 42,000 tons per year of old newspapers, old corrugated containers and municipal curbside collection papers. Grades produced were plain chip, laminating chip, partition chip, and lined chip (PAS-00004269).

Reports to the PVSC during the years 1925, 1926, and 1927 identified Newark Boxboard as discharging self-identified wash water via the storm sewer to the Passaic River. The "polluting" discharge was characterized as having high suspended solids and odors. The wash-water discharge reportedly frequently blocked a nearby creek (PAS-00103660, 682, 689, 695, 945, 950). The 1926 and 1927 reports note that Newark Boxboard was connected to the PVSC (PAS-00103694-95; PAS-00103945).

A February 6, 1926, Letter to Passaic Valley Sewerage Commissioners identified Newark Boxboard as a polluter with the listed pollutant being "foul paper wastes" (PAS-00103660). In March 1926, Newark Boxboard stated in a letter to the Passaic Valley Sewerage Commission (PVSC) that they had stopped all pollution (PAS-00103682). However, according to the *Report on the Status of Pollutions from Industrial Establishments* prepared in November 1926, Newark Boxboard was still considered a polluter discharging old paper sludge at times to the Passaic River (PAS-00103695). The Report also notes that Newark Boxboard was connected to the PVSC (PAS-00103694).

According to the Response to Request for Information, Book Covers, Inc., a New Jersey corporation incorporated on October 19, 1960, was merged into Newark Group

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Industries, Inc. on May 2, 1988 to form BCI Newark. BCI Newark formerly operated at the site and was a separate division of The Newark Group. During the time it operated at the site, it was reported that no hazardous substances, other than those contained in “over-the-counter” cleaners and similar products generally available to the consuming public and in their original packaging, were used, generated, stored, disposed or otherwise handled in its manufacturing process (PAS-00004278).

According to a *Notice of Administrative Revocation from NJDEP*, dated October 2005, the New Jersey Department of Environmental Protection (NJDEP) confirmed that Newark Boxboard had ceased all activities requiring a NJPDES permit. Therefore, NJPDES permit No. NJG0107000 was revoked effective August 31, 2005 (PAP-00114672).

In a “1978/1979 City of Newark, New Jersey Feasibility Study, Pollution Abatement Program,” industrial discharge was noted on the easterly line of the Morris Canal storm sewer with Newark Boxboard identified as the sole industrial contributor to the discharge in that segment of the line. An estimated discharge of 0.16 million gal per day (MGD) was identified from Newark Boxboard (PAS-00103883). The Feasibility Study characterized that discharge as “polluted” (PAS-00103891), but none of the “pollutants” analyzed in the stormwater samples taken along the Morris Canal storm sewer east of Lockwood Street (MC-100 and MC-104) were COCs (PAS-00103903-PAS-00103905; PAS-00103873).”

Newark Boxboard’s 1980 PVSC Sewer Connection Application noted concentrations in wastewater discharged to the sanitary sewer of the parameters lead, mercury, and copper (PAP-00115480). Samples collected as part of Newark Boxboard’s PVSC Sewer Connection Application in January 1980 reported copper at 0.316 milligrams per liter (mg/L), lead at 0.942 mg/L, and mercury at 0.0016 mg/L (PAP-00115480). It also was reported in the Application that a total of 365,000 gallons was discharging annually to the storm sewer (PAP-00115476).”

In 1986, a *Worker and Community Right to Know Survey* reported that polychlorinated biphenyls (PCBs) were on site in a transformer casing (PAP-00113837). According to a Response to Request for Information, dated April 2003, PCB-bearing transformers were removed from the facility in 1988. No information regarding releases associated with transformers at the facility was identified based on a review of available documents.

Polycyclic aromatic hydrocarbons (PAHs) were detected in the surrounding soil in sampling conducted in 2012 at the former 30,000-Gal No. 6 Fuel Oil Underground Storage Tank (UST) (PAP-00114705-06).

A Community Right to Know Survey from 1992 reported that Newark Boxboard’s chemical inventory included copper as a component (60-69%) of a product (Certanium 70F) which was stored in the Store Room (PAP-00114452). In 1993, the Community Right to Know Survey reported that Newark Boxboard’s chemical inventory included lead as a component (25-49%) of dry film and copper as a component (60-69%) of a product which were still stored in the Store Room (PAP-00114465-66).”

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Test results for boxboard stock, plain chip paperboard, old newspaper, and old corrugated cuts from 1993 and 1994, included with the Response to Request for Information, were all reported as "Pass" for lead, mercury, PCBs, dichlorodiphenyltrichloroethane (DDD), dichlorodiphenyldichloroethane (DDE), and dioxin indicating the results were less than their respective limits (PAS-00075522-46).

Community Right to Know Surveys from 1994 through 1998, and 2000 through 2002 reported that Newark Boxboard's chemical inventory included pure, solid copper (PAP-00114472; PAP-00114488; PAP-00114519; PAP-00114521; PAP-00114524; PAP-00114538; PAP-00114570; PAP-00114644).

According to a Response to Request for Information, the Site has operated under the Resource Conservation and Recovery Act (RCRA) Hazardous Waste Generator ID Number EPA ID NJD000556837 (PAS-00004267). The Response additionally reported that hazardous substances being utilized, manufactured, discharged, released, stored or disposed of by Newark Boxboard included PCBs, copper, lead, and mercury (PAS-00004267-68).

4. Identified COCs

- PCBs (present in transformers)
- PAHs (used and released)
- Copper (used and released)
- Lead (used and released)
- Mercury (generation and release)

PCBs

A December 10, 1985 letter from Newark Boxboard to the Newark Fire Department reported the discovery of PCBs in one of the transformers at the site (PAP-00352912). The transformers were properly disposed of in 1988 (PAP-00112964-65).

PAHs

During the removal of the 2,500 gallon No. 6 fuel UST in 1991, an inspection of the tank and excavation revealed signs of corrosion on the fuel oil tank and visual evidence of contamination in the excavation. During excavation the piping and the tank were observed to be leaking. 13 discrete soil samples were collected from the underground tank excavation and submitted to a laboratory for analysis to assess the condition of the soil surrounding the tank. All soil samples collected from the excavation were analyzed for Petroleum Hydrocarbons utilizing EPA Method 418.1. Because some samples contained greater than 100 ppm of petroleum hydrocarbons, five samples were analyzed for base neutrals utilizing EPA Method 8250+15. Pyrene was detected at 12,000 µg/kg in one sample (PAP-00114157-58, 61, 64).

As noted in the *Remedial Investigation Report with LNAPL Interim Remedial Measures Report*, dated November 2016, samples were collected in 2012 as part of the remediation of the soils at the location of the former 30,000-Gallon No. 6 Fuel Oil UST. One sample location southeast of the former UST location contained benzo(a)anthracene at 5 ppm; benzo(a)pyrene at 3.6 ppm; benzo(b)fluoranthene at 2.0

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ppm and, dibenzo(a,h)anthracene at 0.91 ppm. In addition, the Low Molecule Weight (LMW) PAH, naphthalene was detected at 36 ppm (PAP-00114705-06).

Metals – Copper, Lead and Mercury

An April 1980 PVSC Heavy Metals Source Determination Study, Phase II reported that Newark Boxboard had an average daily flow to the PVSC determined during two consecutive days of sampling of 0.3560 MGD and flow-proportioned results of composite samples on two consecutive days expressed on a mass basis were 0.938 pounds (lbs.) per day of copper, 0.891 lbs. per day of lead, and 0.0048 lbs. per day of mercury (PAS-00103655; PAP-00206256; PAP-00206296).

A March 1975 Waste Effluent Survey for PVSC reported that a semi-quantitative scan of metal ions found copper to be less than 0.20 parts per million (ppm) and lead between 0.20 to 1.0 ppm (PAP-00114473). A five-day average found that the waste effluent was being discharged at 317,000 gal per day in 1975 (PAP-00114474).

A 1978 Industrial Waste Questionnaire stated that facility wastewater was not treated prior to discharge to the sewer (PAS-00000441), but the facility's 1980 PVSC Sewer Connection Application described the following pretreatment process: "A Sinclair floatwash unit is used to remove fibers from the white water so that it can be reused on showers, sealing water, hoses, etc. The excess of this clarified water is discharged to city sewer. Screens have 60 [micron] openings" (PAP-00115477). The 1978 Questionnaire reported that previous measurements showed a daily flow of 563,000 gal per day with sample results for lead and copper at 1.0 mg/L and 0.2 mg/L, respectively (PAS-00000441).

Wastewater analysis results from 1974 to 2002 included with the Response to Request for Information reported results for copper ranging from 0.042 to 0.64 ppm; lead ranging from 0.004 to 0.942 ppm; and, mercury ranging from 0.0002 to 0.001 ppm (PAS-00075548). Pounds generated per year in wastewater from 1975 to 2002 were reported ranging from 6.5 to 352.21 lbs. for copper; 0.97 to 283.3 lbs. for lead; and 0 to 0.55 lbs. for mercury (PAS-00075550).

Samples collected in December 1994 from the PVSC discharge show that in regards to copper, two of the three samples were above the Threshold Value, but all three were below the Local Limit. The average results were above the Threshold Value and below the Local Limit. For lead and mercury, all three samples were below the Threshold Value and Local Limits with the average results also below both limits. The results for copper ranged from 0.06 mg/L to 1.7 mg/L; lead ranged from 0.005 mg/L to 0.016 mg/L; and mercury was not detected (less than 0.001 mg/L) (PAP-00114480, 83-85).

According to the Response to Request for Information, Newark Boxboard began reporting the concentrations of metals in its effluent in approximately 1997. From 1997 to 2002, the annual paperboard production at the site ranged from 73,426,000 lbs. to 79,788,000 lbs. and the average total daily wastewater flows ranged from 47,419 gal to 91,332 gal. For 1997 to 2002, the annual range of metals discharged to the PVSC (expressed as pounds of metal per pound of product) by the facility was as follows:

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- Copper (9×10^{-8} to 6×10^{-7})
- Lead (1×10^{-8} to 4×10^{-8})
- Mercury (0 to 3×10^{-9}) (PAS-00004270)

Pretreatment Monitoring Reports from July 1997 through December 2002 reported copper, mercury, and lead concentrations all within the Permit requirements. Copper, mercury, and lead were detected at low levels in various samples over the five year period (PAP-00112755-818).

Pretreatment Monitoring Reports Concentration Range			
Year	Copper	Lead	Mercury
1997	<.01	<0.001 – 0.047	<0.001
1998	0.01 - 1.4	<0.001 - 0.087	<0.001
1999	<0.001 – 2.0	<0.001 – 0.033	<0.001
2000	0.01 – 0.71	<0.001 – 0.018	<0.001 – 0.004
2001	<0.01 – 1.94	<0.001 – 0.023	<0.001 – 0.003
2002	<0.01 – 0.19	<0.001 – 0.046	<0.0005 – 0.001

The following table presents the results of PVSC discharge analysis for samples collected from January to June 2003:

PVSC Discharge Monitoring Data					
Month	Copper	Lead	Mercury	Total Volume Discharged	Citation
January 2003	0.16 mg/L	0.047 mg/L	Not detected	2,688,600 gal	PAP-00114572, 77
February 2003	0.41 mg/L	0.029 mg/L	Not detected	2,042,450 gal	PAP-00114586-87
March 2003	0.07 mg/L	0.029 mg/L	Not detected	1,655,300 gal	PAP-00114600, 08
April 2003	0.03 mg/L	0.018 mg/L	Not detected	1,788,900 gal	PAP-00114611, 19
May 2003	0.04 mg/L	0.021 mg/L	Not detected	2,678,700 gal	PAP-00114623, 30
June 2003	0.02 mg/L	Not detected	0.0004 mg/L	4,422,300 gal	PAP-00114633, 40

Historic Fill

The Allocation Team has determined that the property boundary for 17 Blanchard does partially overlap the regional Historic Fill as designated by the NJDEP.¹

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and

¹Digital Geodata Series, DGS04-7, Historic Fill for New Jersey, <https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm>, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

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mercury.² Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.³ PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.⁴

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below.

COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	68.1 mg/kg
Copper	60.1 mg/kg
Mercury	0.13 mg/kg
Benzo(a)anthracene	5 mg/kg
Benzo(a)pyrene	3.6 mg/kg
Benzo(b)fluoranthene	2 mg/kg
Dibenzo(a,h)anthracene	0.91 mg/kg

Note: The sample results for metals listed in this table are from the soil sampling done in the area assumed to be where the historic creeks had existed. It was concluded that historic fill was present on 17 Blanchard based on visual inspection of soil borings along the property boundary of 17 Blanchard and 60 Lockwood Street, therefore no analysis was available.

The *Remedial Investigation Report with LNAPL Interim Remedial Measures Report*, The Newark Group, Inc. Facility, 60 Lockwood Street (Block 2412; Lot 58), 84 Lockwood Street (Block 2412; Lot 17), 17-61 Blanchard Street (Block 2412; Lot 75) dated November 2016 (2016 RIR), stated that according to the NJDEP's GIS database and New Jersey Geological Survey's 2009 Historic Fill of the Elizabeth Quadrangle map, the site is located within mapped Historic Fill boundaries. This was corroborated by observations made during the site soil investigation, which identified fill material consisting primarily of sand and gravel, with varying amounts of ash, glass, wood, and brick in the upper five to eight feet of soil (PAP-00114681-82). Note this report includes sites that are not part of this allocation and the historic fill discussed above is for all Newark Group properties.

² *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

³ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

⁴ NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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The 2016 RIR stated that according to a 1908 historical Sanborn map, two creeks historically crossed the 17 Blanchard Street property. The creeks were reportedly filled sometime between 1892 and 1908; however, no detailed information or sampling data are available for this fill material. Therefore, in September 2012, soil sampling was conducted to evaluate potential impacts associated with the fill material. Two soil borings were advanced in the area of the two former creeks to approximately 5 feet bgs. No discoloration or elevated PID readings were observed during field screening; therefore, one soil sample was collected from each boring from approximately 0 to 0.5 feet bgs. Copper, lead and mercury were detected; however, it was concluded that the SPLP analytical results demonstrated that the low levels of lead and mercury in the soil would not have the potential to impact groundwater; therefore, further investigation of these metals was not warranted. This area was to be included in the site-wide historic fill investigation (PAP-00114710-11).

The 2016 RIR reported the following investigation into the site-wide historic fill. "In the February 2012 SIR, 16 soil borings were advanced to investigate nine specific areas of concern. Based on the characterization of the recovered soils, materials consistent with the presence of historic fill materials (i.e., cinders, ash, wood, glass, and concrete fragments) were identified in the shallow subsurface throughout the site.

In addition, four of the five soil samples collected from fill material within AOC 27: Railroad Tracks (60 Lockwood Street) contained elevated concentrations of arsenic and PAHs above the Residential Direct Contact Soil Remediation Standard (RDSCRS), Non-Residential Direct Contact Soil Remediation Standards (NRDSCRS), or Default Impact to Ground Water Soil Screening Levels (DIGWSSL). These constituents and the concentrations detected are consistent with those typically observed in historic fill material. Therefore, in accordance with the Technical Requirements for Site Remediation (TRSR), additional soil characterization was conducted to determine if historic fill material is present throughout the site (PAP-00114711-12).

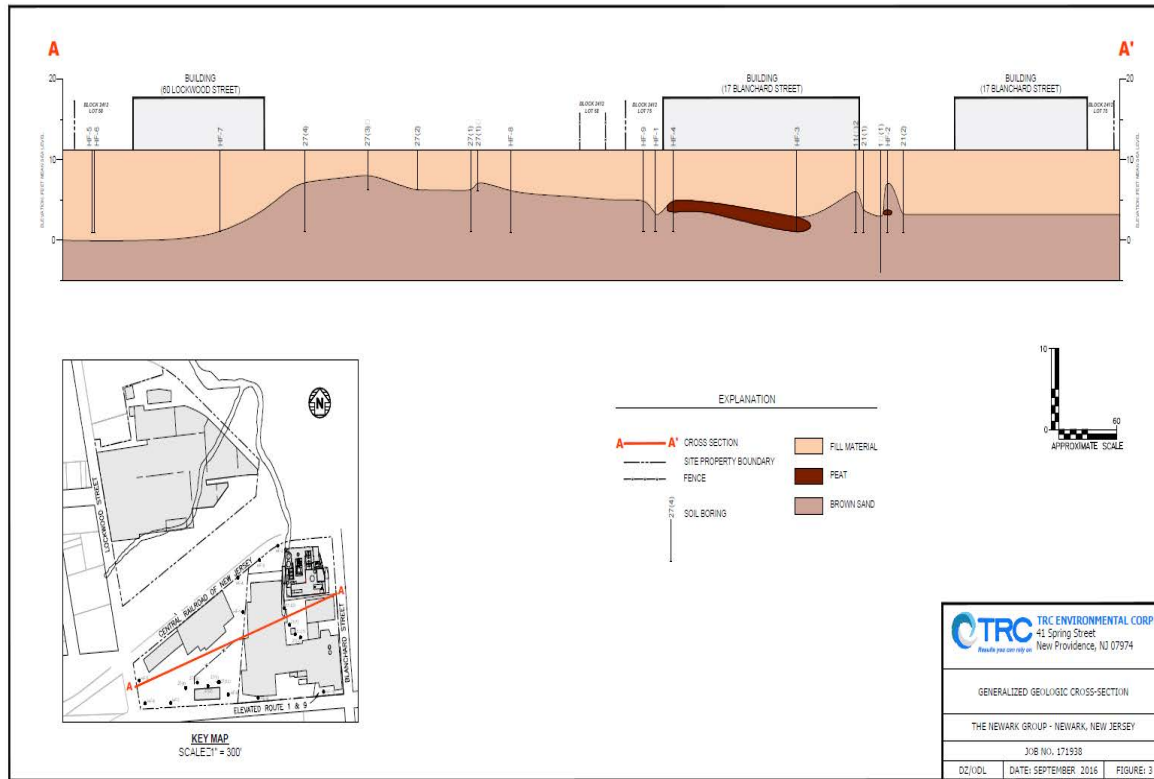
Further investigation for the historic fill at 17 Blanchard and 60 Lockwood Street was conducted in 2014. Soil borings were advanced along the property boundary of 17 Blanchard Street and 60 Lockwood Street parcels. The borings were advanced to the top of native material (approximately 10 feet bgs) to visually evaluate the extent and thickness of the fill material. Fill material consisting of cinders, brick fragments and crushed concrete was identified in all borings. The fill material extended to between approximately 8.5 and 10 feet bgs, but did not intersect the shallow ground water table, which was encountered between approximately 8 and 13 feet bgs (PAP-00114712). Note: Only visual inspection was conducted on these samples; no soil sampling was analyzed.

See the following figure obtained from the 2016 RIR for a geological cross-section to demonstrate fill material that exists beneath 17 Blanchard.

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(PAP-00114722)

A *Response Action Outcome*, dated December 23, 2016 was issued by TRC Environmental Corp. for the remediation of several Areas of Concern at the Newark Group properties. The Response Action Outcome stated that it did not include contamination resulting from the presence of historic fill (PAP-00115447-51).

5. COC Pathways

Storm Sewer

A 1977 data verification sheet identified the following sources of intermittent wastewater discharges from Newark Boxboard to the Passaic River via a storm sewer: (1) Rewinder Brake Cooling Water; (2) Floor Drains; (3) Sump Pump Discharge; and, (4) Vent Line from Condensate Tank (PAS-00103684-85).

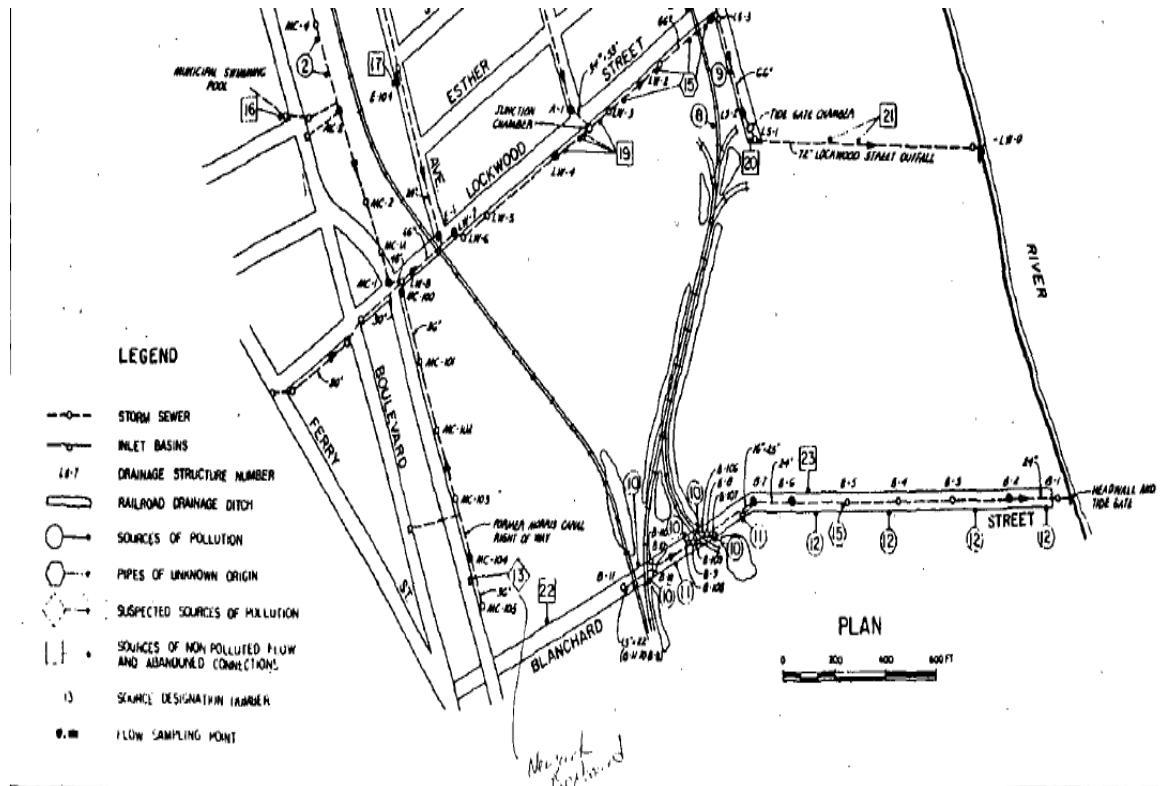
An August 30, 1977 letter from the PVSC to Newark Boxboard Company noted that during an inspection, several of Newark Boxboard discharges to the Morris Canal storm sewer appeared to contain objectionable materials such as boiler blowdown, process wash down, and minor amounts of spilled petroleum products. The discharge was noted to reach the Passaic River through the Lockwood Street outfall (PAS-00103713-14).

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The following map shows the location of Newark Boxboard relative to the storm sewer and the Passaic River. Number 22 shows the location of the continuous low volume discharge of cooling water entering the gutter from Newark Boxboard.



(PAS-00004238)

According to the Response to Request for Information, in approximately 1980, Newark Boxboard rerouted the non-contact cooling water, process wash down water, and boiler blow down wastewater to discontinue its discharge to the Morris Canal storm sewer. These waters were discharged to the PVSC. Currently the connection to the storm sewer is sealed. Floor drains in collection areas and process areas return excess water to a central collection tank where it is re-used in the papermaking process. Excess water that is not reused is discharged to the PVSC (PAS-00004273).

According to a March 30, 2000, letter report to NJDEP, Water Discharge Permit No. NJ0107000, there were five sewer drains around the facility, three located around the waste paper storage building and the other located at the loading dock. All five drains empty into surface water (PAP-00352933).

All stormwater in open paved areas was directed to a series of storm sewers, stormwater generated on unpaved areas abutting the northern portion of the facility building was piped to a stormwater intake trench. Stormwater from the storm drains flows directly to a storm main which ultimately joined a main for disposal via the municipal sewerage system. The facility diverted several of the roof drains to the

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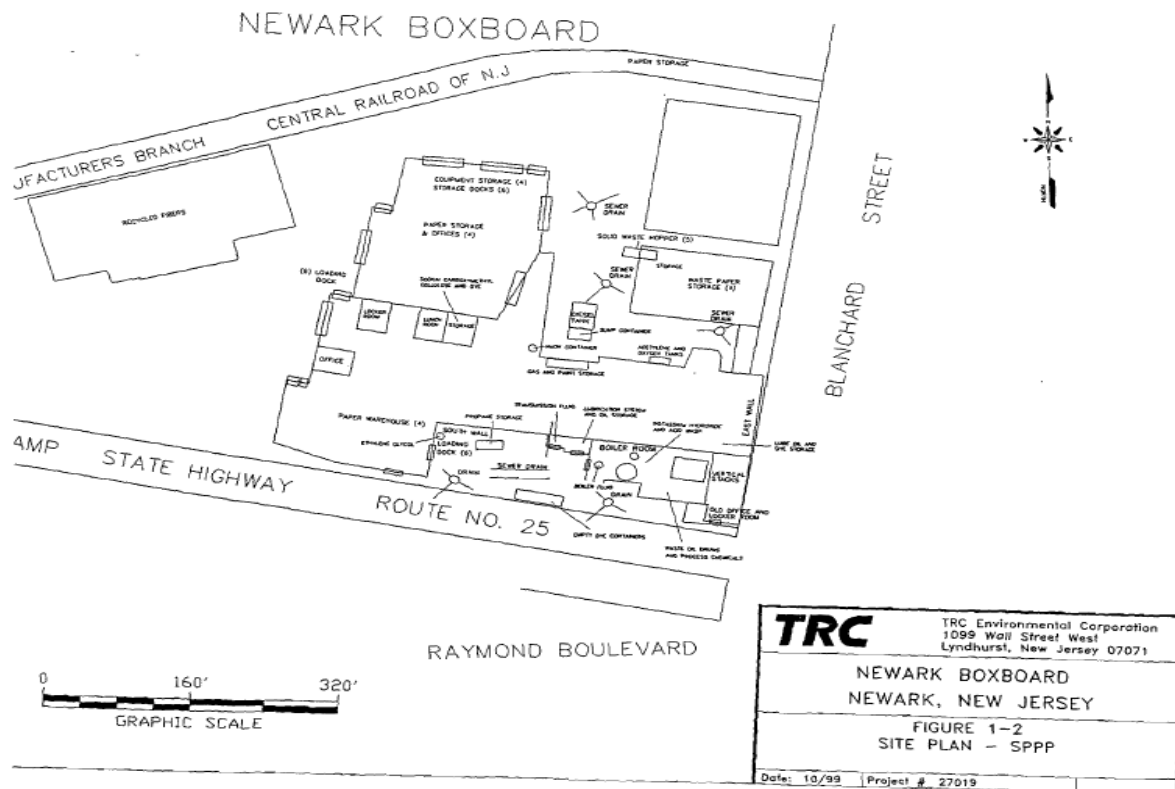
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storage sump for use in the recycling process or discharge to the local publicly owned treatment works (POTW) through PVSC Non-Domestic Wastewater Permit No. 2040 1402, expiration date of July 4, 2001 (PAP-00352934).

The 2000 letter report also stated that the main area of potential pollutant sources which may affect the quality of stormwater discharges were the three sewer drains around the waste paper storage facility. As part of the Stormwater Pollution Prevention Plan (SPPP), Newark Boxboard proposed to divert three of the storm drains in the Waste Paper Storage Area to the building sump. It was reported that the only other potential areas where stormwater discharge exposed to source materials which could not practicably be prevented or eliminated are storm drains located in parking areas (PAP-00352934).

On October 3, 2000 NJDEP confirmed that the diverting of the three sewer drains around the waste paper storage facility to the basement sump was a sound Best Management Practice to eliminate the exposure of stormwater to these source materials. Once the project was complete an inspection was needed to evaluate eligibility for coverage under the General Industrial Stormwater Permit (NJ0088315) (PAP-00352942).

See the following Site Plan from the above discussed SPCC.



(PAP-00352941)

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Sanitary Sewer

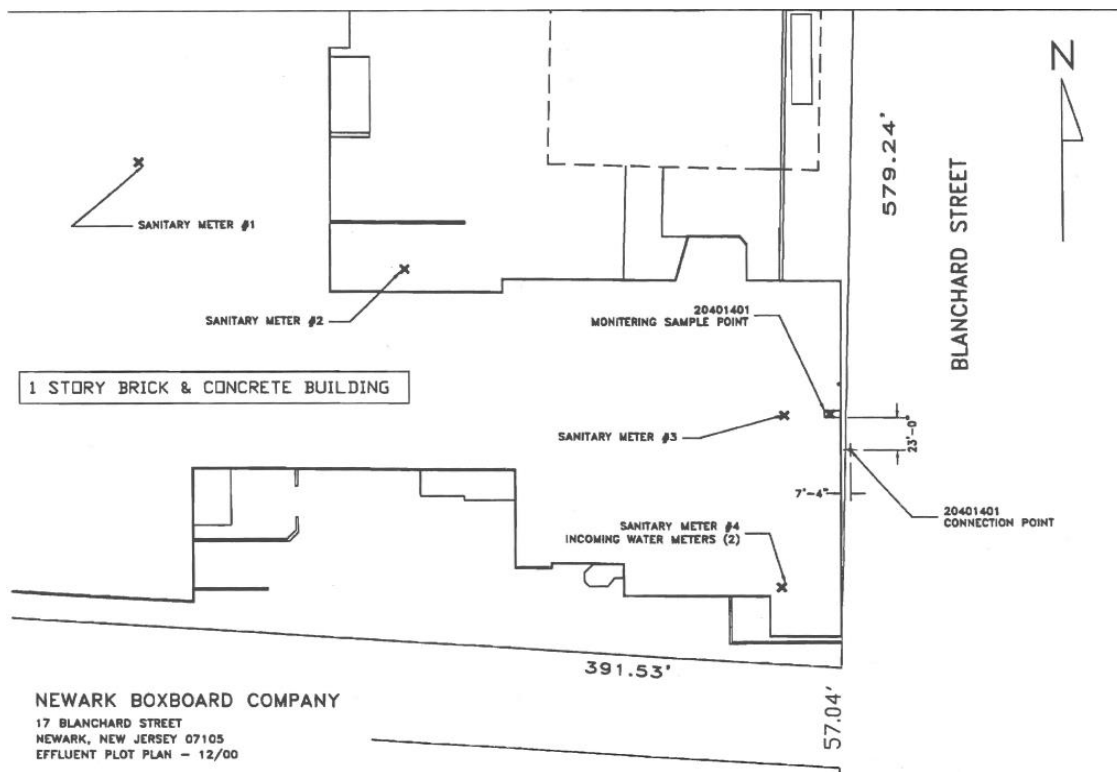
According to a 1979 Sewer Connection Application, 127,527,500 gallons of water was used for sanitary sewer (PAS-00103669).

According to a June 25, 1979 letter to EPA, Newark Boxboard stated that "all process and sanitary waste were discharged to the Newark City Sewer. At that time the following processes were discharged:

- Point A: 1-inch pipe from Rewinder Brake Cooling Water and two 4-inch floor drains
- Point B: Two 1 ¼-inch Sump Pump discharge and a 2-inch vent line from condensate tank
(PAP-00115469)

Newark Boxboard had Sewer Connection Permit Number 20402400, for the discharge of wastewater to the PVSC effective July 27, 1981 with an expiration date of July 27, 1986 (PAP-00352943). According to the Response to Request for Information, the connection to PVSC was the only point of discharge from the site. Newark Boxboard reported that it had always been in compliance with its PVSC permit (PAS-00004267).

The following map included in the site's 2001 sewer use permit application shows the location of the effluent connection point and the monitoring sample collection point:



(PAP-00114536)

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6. Regulatory History/Enforcement Actions

Inspections

On July 30 and 31, 2002, a Compliance Evaluation and Assistance Inspection (CEAI) was conducted by NJDEP. No potential violations were noted. It was noted that a revised SPPP was submitted December 22, 2000. The inspection also noted that contaminated stormwater goes to PVSC via floor drains. The stormwater from roof-drains and areas with no source materials was discharged through three outfalls where sampling and monitoring were required (PAP-00352930-32).

Violations

A 1970 Stream Contamination Report reported that on April 6, 1970, as a result of negligence, a violation occurred at Newark Boxboard when approximately 500 gal of paper pulp overflowed into a driveway and then into the Blanchard Street storm sewer (PAS-00035386).

Permits

Newark Boxboard Permit Summary				
Permit No.	Issued by:	Use	Dates	Discharge Limits
20401400	PVSC	Sewer Connection	July 27, 1981 - March 1992	Copper, Lead, Mercury
20402402	PVSC	Sewer Connection	March 1992 - July 14, 2001	Copper, Lead, Mercury
20200033	PVSC	Sewer Connection	July 15, 2001 - June 30, 2006,	Copper, Lead, Mercury
NJ0107000	NJDEP	Stormwater	1997 - May 31, 2002	Not known

A Public Notice of Newark Boxboard's application for a NPDES permit was issued on August 1, 1980 (PAP-00113923-25). The final permit, NJ0031682, did not become effective, however, because USEPA ultimately determined that a permit was not required because the subject discharge had been rerouted to the PVSC (PAP-00114014-16).

The site operated with a PVSC Sewer Connection Permit No. 20401400, issued on July 27, 1981 (PAP-00352943). The permit expired July 27, 1986 (PAP-00352943). The permit was renewed and was effective from July 14, 1986 through July 14, 1991 and July 14, 1991 through July 14, 1996 (PAP-00113822; PAP-00113854-67).

In March 1992, Permit No. 20401400 was revised and the site operated a PVSC Sewer Connection Permit No. 20402402 through July 14, 1996 (PAP-00113854; PAP-00114405). The permit was renewed and was effective from July 14, 1996 through July 14, 2001 (PAP-00114495).

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From July 15, 2001, through June 30, 2006, the site operated with a PVSC Sewer Connection Permit No. 20200033 (PAP-00114546).

A March 30, 2000, letter from Newark Boxboard to the NJDEP stated that Newark Boxboard at the time operated under stormwater discharge permit Number NJ0107000 and was requesting the NJDEP to re-issue the facility a general permit upon implementation of the SPPP since contact between the stormwater and source materials would be eliminated upon the implementation of the plan (PAP-00352933).

An April 2003 letter from Newark Boxboard to the NJDEP transmitted an application for permit renewal as the stormwater discharge permit Number NJ0107000 expired May 31, 2002. The permit renewal application removed one of the outfalls and stated the flow from that outfall was redirected for internal use (PAP-00114646-71).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Closure Report at Newark Boxboard 17 Blanchard St, UST No. 106607 dated November 1991 (PAP-00114144)
- Remedial Investigation Report with LNAPL Interim Remedial Measures Report, The Newark Group, Inc. Facility, 60 Lockwood Street (Block 2412; Lot 58), 84 Lockwood Street (Block 2412; Lot 17), 17-61 Blanchard Street (Block 2412; Lot 75) dated 2016 (PAP-00114673)

According to the 2016 RIR, additional remediation was conducted in 2012 at the location of the former UST. In September 2012, five soil borings were installed and five soil samples were collected to further delineate light nonaqueous phase liquid (LNAPL) and evaluate potential petroleum-related PAH impacts to soil. At one sample location southeast of the former UST location benzo(a)anthracene was detected at 5 ppm; benzo(a)pyrene was detected at 3.6 ppm; and, dibenzo(a,h)anthracene was detected at 0.91 ppm. In addition, the PAH, naphthalene was detected at 36 ppm (PAP-00114705-06).

According to the 2016 RIR, soil sampling was conducted in September 2012 to evaluate potential impacts associated with fill material suspected at the location of two former creeks. Two soil samples were collected. PAHs were not detected above the most stringent remediation standards or screening levels in either sample. Mercury was detected at 0.13 mg/kg in one sample (PAP-00114710-11, 5135). Lead and copper were also detected, but not above the most stringent remediation standards or screening levels (PAP-00114711, 5159, 5161). The concentrations detected were as follows:

Analyte	Sample 1 Result	Sample 2 Result
Copper	60.1 mg/kg	37.7 mg/kg
Lead	10.3 mg/kg	68.1 mg/kg
Mercury	Not detected	0.13 mg/kg

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Analyte	Sample 1 Result	Sample 2 Result
Benzo(a)anthracene	Not detected	0.0480 mg/kg
Benzo(a)pyrene	Not detected	0.0441 mg/kg
Benzo(b)fluoranthene	Not detected	0.0417 mg/kg
Benzo(k)fluoranthene	Not detected	0.0322 mg/kg
Benzo(g,h,i)perylene	Not detected	0.0493 mg/kg
Chrysene	Not detected	0.0476 mg/kg
Dibenzo(a,h)anthracene	Not detected	0.0134 mg/kg
Fluoranthene	Not detected	0.0927 mg/kg
Indeno(1,2,3-cd)pyrene	Not detected	0.0325 mg/kg
Phenanthrene	Not detected	0.0483 mg/kg
Pyrene	Not detected	0.0797 mg/kg

(PAP-00115134-35, 58-61)

Remedial Activities

As reported in the 1991 Closure Report for Newark Boxboard Company, on June 18, 1991, 2,500 gallons of No. 6 heating oil were transported from the NBB facility for offsite disposal (PAP-00114156, PAP-00114175). On September 24-27, 1991, approximately 1,050 tons of soil were excavated at the NBB facility and transported for offsite recycling (PAP-00207817). According to the Official Certificate of Recycling by TPS Technologies Inc., 1,036.14 tons of petroleum-contaminated soil were received for recycling from Newark Boxboard (PAP-00208199).

On March 12, 1992, NJDEP notified Newark Boxboard Co. that they had complied with the Departments existing requirements regarding corrective action for the investigated UST system. Therefore, no further corrective action was required (PAP-00112753).

According to a Discharge Investigation and a Corrective Action Report, dated April 22, 1992, prepared by Vectre Corporation, analysis of post-excavation soil samples following the removal of the 30,000-gallon No. 6 heating oil UST on June 19-21, 1991 stated that soils in the vicinity of the UST had been impacted by heating oil. In September and October 1991, soil borings and additional monitoring wells were drilled to delineate the extent of free product and soil contamination (PAP-00207811). PAHs were found in several soil samples. Naphthalene concentrations ranged from 83,000 to 120,000 mg/kg; fluorene ranged from 12,000 to 18,000 mg/kg; phenanthrene ranged from 42,000 to 57,000 mg/kg; and, pyrene was found in one soil sample at 12,000 mg/kg (PAP-00114164-65). Laboratory comments accompanying the results for fluorene and pyrene note that the compounds were detected below the method detection limit (PAP-00114164-65).

8. Summary of Asserted Defenses

A 2016 Request for *De Minimis* Settlement on behalf of The Newark Group stated that they were not associated with any release or discharge of dioxins, furans, or PCBs into the Lower Passaic River (PAP-00115458). Because Newark Boxboard used recycled feedstock, and not virgin pulp, it did not perform chlorine or any other pulp-bleaching

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processes that may result in the formation of dioxin (PAP-00115459). It was also stated that the only association between Newark Boxboard and any of the three primary COCs is Newark Boxboard's off-site disposal of PCB-containing transformers in 1988 (PAP-00115460).

The Newark Group asserts the following:

- PAHs in Newark Boxboard facility soil and groundwater associated with the release from a UST of No. 6 fuel oil cannot give rise to CERCLA liability under the Act's petroleum exclusion, CERCLA § 101(14) [42 U.S.C. § 9601(14)]; and,
- To the extent a nexus is alleged between the Newark Boxboard's discharges to the PVSC and COCs in the Passaic River, some or all of such discharges are subject to CERCLA's federally permitted release exemption, CERCLA §§ 101(10) & 107(j) [42 U.S.C. §§ 9601(10), 9607(j)]

Newark Morning Ledger Co.

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NEWARK MORNING LEDGER COMPANY

Facility Name, Address and Size: Newark Morning Ledger Co. (NML); 1 One Star Ledger Plaza Newark, NJ 07101 [Block 104, Lot 21 (Building) and Block 105, Lot 6 (Parking Lot)]; approximately two acres (PAP-00000636). In 1978, NML had 793 full time and 458 part time employees working three shifts per day, seven days per week (PAS-00077359). By 1990 NML employed 950 full time and 100 part time employees working three shifts per day, 365 days per year (PAS-00077384). In August 1992, printing operations ceased and former production areas were repurposed (PAP-00000636).

1. **Business Type:** NML is a newspaper publishing company that published The Star-Ledger and The Sunday Star-Ledger newspaper (PAP-00000492; PAS-00077054). The principal raw materials include newsprint, ink, and photo substances (PAP-00000439).



(PAP-00000677)

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2. Time Period of Ownership/Operations

Operator: 1966 to December 2014 (PAP-00000636)

Owner: 1964 to 2015 (PAP-00000946)

According to the Case Inventory Document (CID) for Newark Star Ledger, Sanborn Maps identified historical operations at the site from 1892 to 1966 consisted of a former tannery, various manufacturing tenants, a leather finishing business, and a printing press/printing machine rebuilding operation. A deed notice, with an engineering control, for contaminants of concern (COCs), which include polynuclear aromatic hydrocarbons (PAHs), and mercury, was filed for the site on December 19, 2014. The CID reported the exceedances of multiple SVOCs and metals are attributable to historic fill. In addition, groundwater was presumed to be impacted by Historic Fill COCs found in site soils (PAP-00000515, PAP-00212775).

NML began operations at its Star-Ledger Plaza, Newark, New Jersey site in 1966. In or about August 1992, NML ceased production operations at the site. From that time to the present, operations at the Newark site have consisted of advertising, editorial, circulation, administration, composition, and office support (PAS-00077005).

3. Operational History/COC Use and Presence at the Facility

As reported in the *Preliminary Assessment (PA)/Site Investigation (SI)/Remedial Investigation (RI)/Remedial Action Report (RAR)*, dated February 2015 (2015 Report), historical NML operations at the site included:

1966 - 1972 Printing Operations

Printing operations from 1966 to 1972 consisted of two processes: typesetting and photoengraving (PAP-00000639).

Typesetting consisted of the setting of words for each story and advertisement into metal type on a linotype machine. The metal was an alloy of lead, tin, and antimony. The lines of type were melted down onsite and the alloy was reused. Typesetting produced no waste. NML maintained smelters in which they would melt down the alloy plates and reuse the materials. The smelters were reportedly removed in the 1970s after the alloy platemaking operations ceased (PAP-00000639). Based on the available file material, it is unclear if the reference to smelters is to a traditional definition of a smelter or rather a melting pot.

Photoengraving operations involved the etching of photographs onto zinc plates. Waste from these operations included film scraps, which were discarded for off-site disposal, and the zinc plates, which were melted down and reused. Spent nitric acid from etching operations was diluted with water and discharged to the sanitary sewer pursuant to a permit issued by Passaic Valley Sewerage Commission (PVSC). Available references did not include a copy of this permit. Photodeveloping solutions were diluted and discharged in the same manner (PAP-00000639).

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Platemaking involved an assembly process of the typesetting operations discussed above. Once the page of type was assembled, it was pressed by a device called a "mat roller" onto a sheet of damp, soft cardboard. The cardboard, once pressed with the words and pictures for a particular page, were dried in a special dryer. Dried mats were sent to the stereotyping department where they were set in a casting machine. Molten lead alloy flowed against the mat creating a metal copy of it; plates were then cooled with water. After the newspaper was printed, the lead plates were melted down and reused. Small quantities of impurities generated during the melting process were sent offsite for disposal. Cardboard mats were discarded off-site and wastewater from the cooling process was discharged to the sanitary sewer via a permit with PVSC. Available references did not include sampling data for this wastewater discharge (PAP-00000639-40).

Waste ink and waste solvent used to clean the presses were combined and collected in drums. Minute amounts of lubricating oils were also drummed. All drums were stored in a designated room awaiting proper disposal. Waste inks and solvents were picked up by the suppliers and transported to facilities chosen by the supplier. Used lubricating oils were sent to a recycling facility (PAP-00000640; PAS-00077009).

1972 - 1992 Printing Operations

Printing operations during this time were done by keyboarding the letters onto photon tape, the tape was then fed into a reader that printed in a form suitable for transfer to a dummy page. Photographs were taken with special cameras and converted to dots; this was called "velox". The velox was pasted onto the dummy page with the type and the entire page was then photographed (PAP-00000641).

Beginning in 1979 all liquid photographic wastes were run through a silver recovery unit. All silver recovered from the unit was sold to a private vendor. The remaining waste was diluted with water and discharged to the sanitary sewer via a permit with PVSC. The negative of the dummy page was applied to a plate made of photopolymer plastic; the plate was then subjected to ultraviolet light and rinsed with water. The wastewater was discharged to the PVSC via NML's permit. Waste negatives were sold for scrap (PAP-00000640).

According to a letter dated February 23, 1990, NML generated two types of "waste process materials" including: 1) waste ink (non-hazardous) and 2) waste petroleum naphtha (waste solvents). Approximately 60-70 55-gallon drums of waste ink (non-hazardous) were produced per month. NML purchased approximately 508 55-gallon drums of ink per month. The ink was used to print the newspaper. The drums of waste ink were stored in a separate designated and contained area in the building basement. The empty ink drums were sent back to the manufacturer, not manifested. Waste petroleum naphtha (waste solvents) was sent out to a sales/service company. All solvents were stored in a solvent safety room in the building (PAS-00077448).

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The majority of chemicals/hazardous materials were stored/used in the basement area Mezzanine, and second floor of the site. Those areas included the Reel Room/Press Room, Maintenance Shop/Department, Lift Area, Machine Shop, Forklift Area, and Press Deck (PAP-00000644). Black ink containing PAHs was stored in aboveground storage tanks (ASTs) in the Tank Room of the basement area.

1992 - October 2014

Platemaking, printing, and mailroom processes at the site ceased in August 1992. Versions of typesetting and photoengraving were now paginated on computers. Occasionally hand-pasted dummy pages were produced (PAP-00000640).

In 1996, NML installed a unit that recycled the small quantity of photochemicals, which were used until operations ceased at the site. The photochemicals were recycled through the unit multiple times before they were diluted, filtered and slowly discharged to the sanitary sewer (PAP-00000640). Available references did not report the composition of the photochemicals and whether they contained any of the COCs. NML's PVSC permit was terminated in November 1993 since the newspaper was not being printed at the site. Domestic waste was still discharged to the sanitary sewer (PAP-00000640).

4. Identified COCs

- PAHs (use, detected)
- Lead (use, storage)
- Copper (detected)
- Mercury (detected)

PAHs

According to Community Right-to-Know surveys ranging from 1988 through 1992, hazardous materials included small amounts of naphthalene (PAP-00000645).

A Statement Regarding the Presence of PAHs in Carbon Black by the International Carbon Black Association reported trace levels of PAHs are associated with carbon black in ink (PAP-000264260). Carbon black is a component of the black newsprint ink used by NML (PAP-00000642).

According to the CID for Newark Star Ledger, the two 5,000-gallon aboveground ink tanks formerly located in the Ink Tank Room located in the basement of the site were removed during cessation of operations in 1992. Two soil borings were advanced through the concrete in the former Ink Tank Room. No exceedances of the most stringent SRS were detected in either sample. Specific contaminant concentration data results for this area were not included in the available references. No further investigation was warranted for this AOC (PAP-00000513).

There were two minor fires in the Newark site's pressroom. During both occasions, the automatic sprinkler system was activated. The water discharged by the sprinkler system was released to the floor drains, which discharge to the sanitary sewer (PAS-00077014, PAS-00077545).

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Metals – Copper, Lead and Mercury

Based on a document entitled “*Executive Summary*”, prepared by Occidental or its consultants, dated July 13, 1995, hazardous substances stored, used or produced at the site included copper, lead and mercury of which documented discharges via CSO to the river included copper 0.133 milligrams per liter (mg/L), lead 0.061 mg/L and mercury 0.003 mg/L (PAP-00212775). According to the *PVSC - Heavy Metal Source Determination Phase II Industrial Contribution after Pretreatment Sub Area 0*, drafted in 1978, the concentrations and sampling results were sometime between 1976-1978.

According to a Response to *Request for Information Letter*, dated March 6, 1997, from 1966 to 1972 NML used a lead, tin, and antimony alloy for typesetting; however, it produced no waste. The lines of type were melted down on site and the alloy was reused (PAS-00077008). Note samples of effluent discharged to PVSC and collected in 1972 contained less than 0.030 milligrams per kilogram (mg/kg) of lead and in 1975 lead concentrations were not detected (PAP-00212784, 89). Note the available documents do not specify where the samples were collected or the discharge flow rate.

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.¹

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.² Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.³ PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.⁴

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00000558; PAP-00212775).

¹Digital Geodata Series, DGS04-7, *Historic Fill for New Jersey*, <https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm>, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

² *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

³ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

⁴ NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	240 mg/kg
Mercury	0.99 mg/kg
Benzo(a)anthracene	49 mg/kg
Benzo(a)pyrene	39 mg/kg
Benzo(b)fluoranthene	44 mg/kg
Benzo(k)fluoranthene	24 mg/kg
Dibenzo(a,h)anthracene	5.8 mg/kg
Indeno(1,2,3-cd)pyrene	24 mg/kg

Based on the undated *Initial Receptor Evaluation Narrative*, soil results obtained from site investigation activities, the following compounds were in exceedance of the most stringent Soil Remediation Standards (SRS) benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene, lead, and mercury. Since the compounds were found across the site, they were attributable to Historic Fill (PAP-00000549). The chart below details the concentrations.

Contaminant	Concentration (mg/kg)	Depth (feet)
Naphthalene	14	5-5.5
Chrysene	64	4.5-5
Benzo(a)anthracene	49	4.5-5
Benzo(b)fluoranthene	44	4.5-5
Benzo(k)fluoranthene	24	4.5-5
Dibenzo(a,h)anthracene	5.8	4.5-5
Indeno(1,2,3-cd)pyrene	24	4.5-5
Beryllium	0.8	4.5-5
Lead	240	4.5-5
Mercury	0.99	4.5-5

(PAP-00000558)

According to a *Response Action Outcome Form*, dated June 23, 2015, groundwater sampling has not been conducted at this site, but based on the observed presence of Historic Fill, it was concluded that contamination related to regional Historic Fill may be present in the groundwater underlying the site (PAP-00004510). NML was issued a soil remedial action permit No. RAP150001, effective on June 1, 2015 for the entire site and a Classification Exception Area (CEA) VIC15001 was established as of May 28, 2015 (PAP-00004512).

According to the Deed Notice, dated December 10, 2014 (Deed Notice), Historic Fill materials were present at the site on Block 104, Lot 21 and Block 105, Lot 6. At Block 104, Lot 21, Historic Fill materials were observed to extend to a maximum depth of approximately 12.5 feet below ground surface (bgs). Historic Fill materials on Block 105,

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Lot 6 were found to terminate at a depth of approximately 5 feet bgs. Fill materials were comprised predominantly of cinders, ash, concrete, and “cave-in” asphalt. COCs comprised metals, PAHs, and naphthalene. Fill material were identified in each of the seven advanced soil borings taken on Block 105, Lot 6 (PAP-00004500; PAP-00000565-72).

5. COC Pathways

Direct Release

According to a 1976 *Overflow Analysis of Passaic River Overflows*, the overflow chamber for the City Dock CSO district is “on the east side of intersection of Raymond Blvd. and Raymond Plaza East.” The district is served by one 108” x 90” rectangular concrete sewer outfall to the Passaic River. Under normal dry weather flow conditions, the flow is diverted to the PVSC interceptor via the regulator. During periods of rainfall, a portion of the combined flow enters the interceptor, with the balance overflowing the stop logs and being discharged through the outfall line into the Passaic River (PAS-00032870).

Storm Sewer

According to a Response to *Request for Information Letter*, dated March 6, 1997, there are storm sewers on site, which receive storm runoff from external areas of the site, such as parking lots. It is believed the storm sewers were first installed between 1965 and 1966 when the building was constructed at the site. Some storm sewers may have been installed after that date (PAS-00077013). Discharges to the storm sewer were directed to the PVSC sewers in University Avenue. The 2015 Report reported that inks were delivered to the site via tanker truck and were unloaded at the Ink Fill Port located adjacent to the southwestern corner of the site. In addition, a storm sewer grate was observed at the end of the Loading & Unloading/Ink Fill Port area (PAP-00000644).

According to 2015 Report interviews, pits existed beneath the Reel/Press Room, which was located in the basement area of the site and operated until 1992. The pits contained drains, which were connected to the sanitary sewer and were blocked in the early 1980s. The Reel/Press Room pits were blocked and cemented over in the early 1990's. During the 2015 Report site inspections, multiple floor drains were observed within the former Paper storage area, Mechanical Room, in the basement, and throughout the upper floors of the site (PAP-00000646).

In addition, newspaper printing operations from 1966 through 1972 included hot type setting which involved the use of lead smelters to melt down used lead plates and create new lead plates for printing (PAP-00000646). According to the Case Inventory Document (CID) for Newark Star Ledger, lead dust from the smelters would have vented to the roof and been discharged by the roof leaders to the storm water drains surrounding the subject property (PAP-00000515). Based on the 2015 Report, storm water during the time of hot type setting printing operations (1966-1972) was connected and managed by the PVSC (PAP-00000646). Based on the available file material, it is

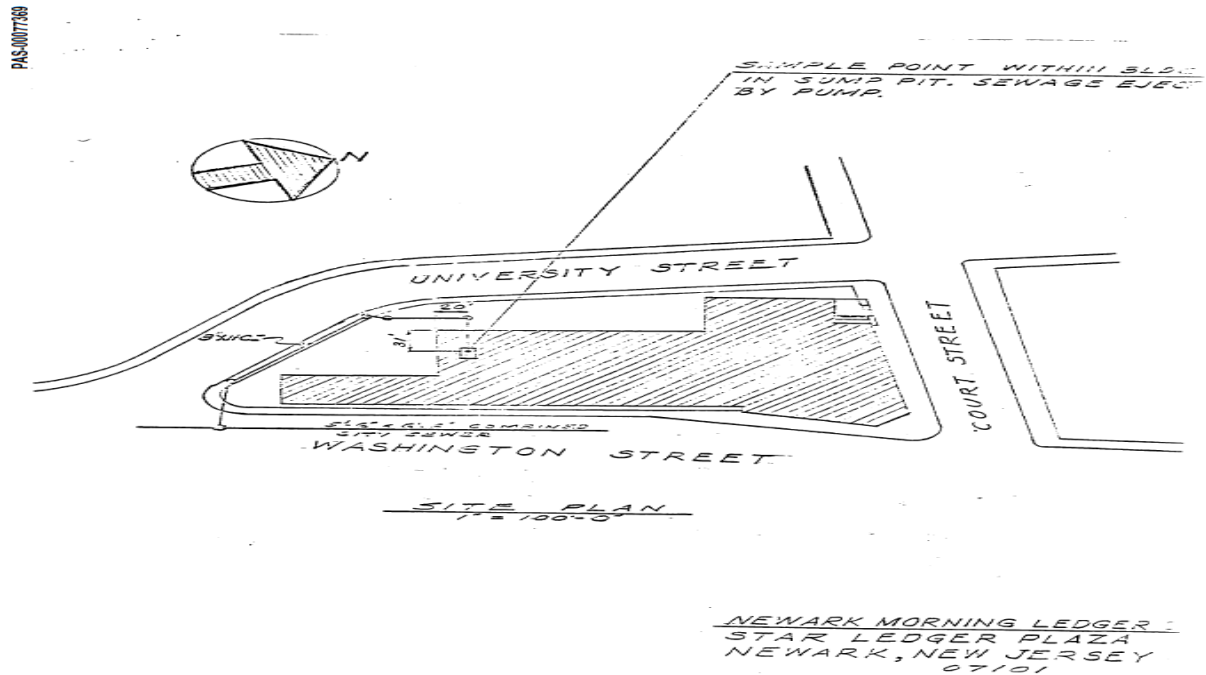
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unclear if the reference to smelters is to a traditional definition of a smelter or rather a melting pot.

A storm water grate was observed at the southern end of the Loading/Unloading Area. Approximately five single storm water sewers were observed adjacent to the sidewalks within the roadway of Washington Street, University Avenue, and Court Street. No staining and/or evidence of a release were observed during the 2015 Report site inspection (PAP-00000647).



(PAS-00077369)

Sanitary Sewer

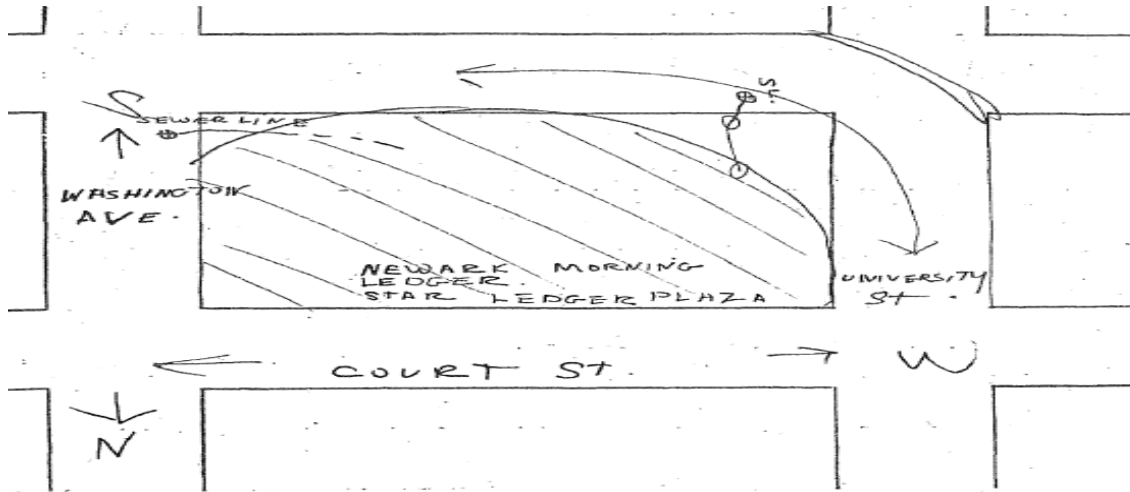
There had been two minor fires in the Newark site's pressroom and during both occasions; the automatic sprinkler system was activated. The water discharged by the sprinkler system was released to the floor drains, which discharge to the sanitary sewer (PAS-00077014, PAS-00077545).

According to the *PVSC - Heavy Metal Source Determination Phase II Industrial Contribution after Pretreatment Sub Area 0*, drafted in 1978 with sampling results from sometime between 1976-1978, NML contributed 0.133 mg/L of copper, 0.061 mg/L of lead, and 0.003 mg/L of mercury to the Passaic River through the combined sewer outfalls (PAP-00212776-77).

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(PAP-00212790)

According to a *Waste Effluent Survey*, dated July 18, 1972, NML used 26,506,876 gallons of water from the City of Newark, New Jersey in 1971 (PAP-00212780). According to a *Report of Water and Wastewater Analysis*, dated April 16, 1975, copper sampled in a 24 hour composite sample equaled 0.20 mg/l (PAP-00212789). NML's applications for sewer connection permits documented the following water usage:

Reporting Year	Sanitary Water (gallons)	Process Water (gallons)	Cooling Make-up Water (gallons)	Total Water Use (gallons)
1972	13,253,438	11,928,094	1,325,344	26,506,876
1978	9,195,912	8,276,321	919,591	18,391,824
1986	17,222,814	12,500,000	4,128,300	33,851,114
1990	16,858,690	15,172,821	1,685,869	33,717,380
1991	10,273,870	9,246,483	1,027,387	20,547,740

(PAS-00077049-109; PAS-00077311-475)

6. Regulatory History/Enforcement Actions

A NJDEP Site Remediation Program Remedial Action Protectiveness/Biennial Certification Form - Soil states a Deed Notice was filed on December 22, 2014 (PAP-00004521).

According to a Soil Remedial Action Permit for Historic Fill letter from NJDEP, dated May 28, 2015, NML received a Soil Remedial Action Permit No. RAP15001 (Deed Notice with engineering control for Historic Fill) which became effective on June 1, 2015 for Block 104, Lot 21 and Block 105, Lot 6 and required monitoring, maintenance, and evaluation for compliance and effectiveness of the remedial action and its associated institutional and engineering controls (PAP-00004474-77, 83)

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Inspections

There is no information regarding inspections in the available file material.

Violations

There is no information regarding violations in the available file material.

Permits

According to the PVSC Application for a Sewer Connection Permit, NML held NJPDES Industrial Waste Permit No. 991304296. Sewer water was received by an unknown body of water (PAS-00077365) and was intermittently occurring between the hours of 6pm and 6am averaging 90,000 gallons daily (PAS-00077367, 403). Pretreatments included silver filtration systems and a wet scrubber for dust on press (PAS-00077368). Note flow rates, discharge monitoring and concentrations were not provided in the application.

NML held wastewater discharge permit number 20402590 between September 22, 1981 and September 15, 1996 (PAS-00077328, 340-41; PAP-00000406, 421) and discharged from outlet(s) number(ed) 20402590-42500-0201 located in the basement on the University Street side) (PAP-00000480). Storm sewer grates were observed in this area and discharges of storm sewer water were directed to the Passaic Valley sewers (PAP-00000644). Note flow rates, discharge monitoring and concentrations were not provided in the permit.

On November 8, 1993, permit 20402590 was terminated and NML was no longer required to submit monitoring data to PVSC since only domestic waste would be discharged from this site (PAS-0077407).

NML was issued identification number NJD991304296 in connection with its manifesting small quantities of Resource Conservation and Recovery Act (RCRA) waste (PAS-00077005). According to a 1988 Annual Generators Report this site generated greater than 10 tons of hazardous waste, but less than 100 tons during the calendar year (PAS-00077072).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- A Preliminary Assessment (PA) / Site Investigation (SI) / Remedial Investigation (RI) / Remedial Action Report "2015 Report" was completed on February 9, 2015 (PAP-00000628-660 (written report) to 4473 with attachments).

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Soil

As reported to the NJDEP *Site Remediation Program Preliminary Assessment/Site Investigation*, soil analytical results were greater than the most stringent Direct Contact Soil Remediation Standards as well as the Ground Water Soil Screening Levels (IGWSSL) for PAHs, metals, and mercury in AOC 1 (Underground Storage Tank), AOC 3 (Loading and Unloading Areas/Ink Fill Port), and AOC 12 (Historic Operations) (PAP-00000520, 649-50, 651-652).

AOC 1 - Underground Storage Tank (Abandoned)

According to the 2015 Report, samples were collected from the tank invert, which was extrapolated to be from 12-12.5 feet bgs. Samples were analyzed for Extractable Petroleum Hydrocarbons (EPH) Category II (CATII) with contingent PAH analysis on 25% of the results where EPH was detected a concentrations greater than 100 mg/kg (PAP-00000648).

Soil samples SB-3, SB-4, and SB-5 exhibited EPH concentrations above 100 mg/kg (172, 266, and 401 mg/kg, respectively). Therefore, soil borings SB-4 and SB-5 were analyzed for PAHs. Both samples exhibited concentrations exceeding the NJDEP Direct Contact SRS and default IGWSSLs for multiple PAHs including benzo(a)anthracene (5.9 mg/kg), benzo(a)pyrene (5.7 mg/kg), benzo(b)fluoranthene (7.5 mg/kg), dibenzo(a,h)anthracene (0.99mg/kg) and indeno(1,2,3-cd)pyrene (3.0 mg/kg) (PAP-00000648; PAP-00000663).

Based on the constituents identified, the concentrations of PAHs were assumed to be associated with Historic Fill at the site and not a release from the UST. PAHs detected in samples associated with AOC 1 were therefore addressed through a deed notice and engineering controls (PAP-00000648).

AOC 3 - Loading and Unloading Areas/Ink Fill Port

According to the 2015 Report, soil samples collected at AOC 3 (Loading and Unloading Areas/Ink Fill Port) exceeded the default IGWSSL for mercury at 0.24mg/kg, 0.84 mg/kg, and 0.16 mg/kg, respectively in soil samples SB-9, SB-10(4.0-4.5 ft. bgs) and SB-10 (9.5-10 ft. bgs) (PAP-00000649).

PAHs were detected in SB-9 in excess of the NJDEP Direct Contact SRS and default IGWSSLs. The PAHs detected were indicative of Historic Fill and not a release from the loading and unloading areas. Therefore, the PAHs were addressed through a deed notice and engineering controls (PAP-00000649).

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AOC 12 - Historic Operations

Building Parcel

According to the 2015 Report, two soil borings SB-6 and SB-7 were advanced to investigate historical operations conducted at the site prior to the construction of the NML building (PAP-00000651).

Analytical results exhibited exceedances of multiple SVOCs and metals, including: naphthalene (14 mg/kg) and chrysene (64 mg/kg) exceeded Residential Direct Contact SRS (RDCSRS) and IGWSSL and benzo(a)anthracene (49 mg/kg), benzo(a)pyrene (39 mg/kg), benzo(b)fluoranthene (44 mg/kg), benzo(k)fluoranthene (24 mg/kg), dibenzo(a,h)anthracene (5.8 mg/kg), and indeno(1,2,3-cd)pyrene (24 mg/kg) exceeded NRDCSRS, RDCSRS, and IGWSSL. Several metals including lead (240 mg/kg) and mercury (0.99 mg/kg) were detected in exceedance of their respective default IGWSSLs (PAP-00000651, 664-66).

- Mercury was detected at a concentration of 0.99 mg/kg in SB-6. The NJDEP's default IGWSSLs for mercury is 0.1 mg/kg. The concentration of mercury detected was consistent with NJDEP background studies for urban areas within the state. Therefore, the concentration of mercury detected in SB-6 was attributable to natural background concentrations (PAP-00000651).
- Lead was detected at concentrations in exceedance of its respective IGWSSL of 90 mg/kg in soil sample SB-6. However, analytical data collected from a deeper soil sample collected from soil boring SB-6 demonstrated that the concentration of lead extinguishes to levels below the default IGWSSL at depths greater than two feet above the groundwater table (PAP-00000651).
- SB-7 exhibited exceedances of multiple PAHs including: naphthalene (exceeded RDCSRS), benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene [exceeded Non-Residential Direct Contact Soil Remediation Standards (NRDCSRS), RDCSRS, and IGWSSL] and indeno(1,2,3-cd)pyrene (exceeded RDCSRS) (PAP-00000651).

Parking Lot Parcel

According to the 2015 Report, seven soil borings were advanced on August 4, 2014 to investigate surficial anomalies identified during the geophysical survey (PAP-00000652).

- A soil sample (1.5-2.0 feet bgs) analyzed for metals and exceedances included lead and mercury above their respective IGWSSLs (PAP-00000652).
- A soil sample (3.5-4.0 feet bgs) exhibited exceedances of multiple PAHs and metals. PAH exceedances included: benzo(a)anthracene (exceeded RDCSRS

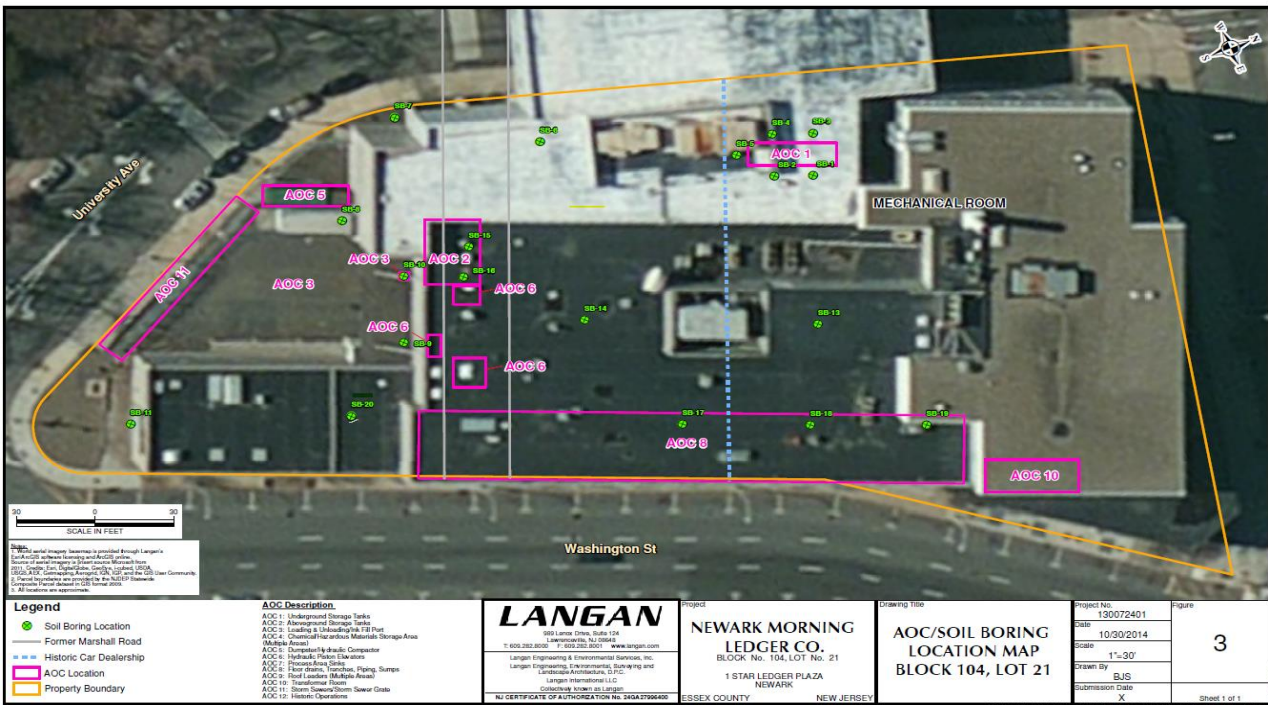
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and IGWSSL, benzo(a)pyrene (exceeded RDCSRS, NRDCSRS, and IGWSSL), and indeno(1,2,3 cd)pyrene (exceeded IGWSSL). Several metals including lead and mercury were also detected in exceedance of their respective IGWSSLs (PAP-00000652).

SVOCs and metal exceedances were assumed to be associated with Historic Fill at the site and were addressed through a Deed Notice and engineering controls (PAP-00000652).



(PAP-00000678)

Remedial Activities

As reported by the 2015 Report, the following remedial activities were implemented:

- A Deed Notice was filed restricting the use of the site to nonresidential uses. The Deed Notice boundary included the entirety of the property boundary (Building Parcel and the Parking Lot Parcel) as identified by the metes and bounds for the site
- The existing NML building footprint, the asphalt paving, the building, and the existing parking lot serve as the contaminant cap (engineering control) restricting direct contact with the subsurface soils and have to remain in place.
- A Remedial Action Permit for Soils was submitted for NJDEP approval. The permit requires maintenance of the cap and biennial inspection and certification of the cap

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to demonstrate that the cap is competent and protective of public health, safety, and the environment.

- A groundwater CEA/WRA associated with Historic Fill was established. The CEA/WRA included the entirety of the property boundary (including the Building Parcel and the Parking Lot Parcel) (PAP-00000634).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

Nokia-Lucent Technologies Inc.

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NOKIA-LUCENT TECHNOLOGIES INC.

Facility Name, Address and Size: Lucent Technologies Inc., 100 Central Avenue, Kearny, New Jersey. The property is 147 acres on the South Kearny peninsula. The facility is located on the Town of Kearny Block 288, Lots 7, 9, 10.01 and 10.02 (PAP-00367653, 663). In 1978, the facility had 6,350 employees (PAS-00080317), while in 1984, the facility had 4,000 employees (PAS-00080504). Available references did not state the number of shifts at the facility.

1. **Business Type:** Manufacturing and assembly of electro-mechanical devices required to interconnect the national telephone network (PAS-00080505).
2. **Time Period of Ownership/Operations**

Operator: Western Electric Company Kearny Works (1925 to 1984)

Owner: Western Electric Company Kearny Works (1925 to 1984)

Nokia-Lucent Technologies Inc. (Lucent) operated and owned the facility as Western Electric Company Kearny Works (Kearny Works) from 1925 to 1984, according to the February 28, 1997 response to an EPA Request for Information (PAS-00080504). The Western Electric Company, Inc. had purchased the property in 1925 and sold it to the Union Minerals and Alloys Corporation in May 1984 (PAS-00080509). In addition, on January 27, 1983, the Western Electric Company announced plans to close the Kearny Works manufacturing facility in stages over several years (PAS-00080463). Western Electric Company, Inc. changed their name to AT&T Technologies, Inc. on January 3, 1984 (PAS-00080509). On December 29, 1989, the company merged into American Telephone and Telegraph Company, which changed its name to AT&T Corp. on April 20, 1994 (PAS-00080510).

According to Lucent's February 28, 1997, response to an EPA information request, Lucent Technologies Services Company was a subsidiary of AT&T Corp. that was transferred to Lucent Technologies Inc. on February 1, 1996 (PAS-00080510).

According to the *Supplemental Preliminary Assessment/Site Investigation/Remedial Investigation Report* (PA/SI/RI Report), dated May 2016, Lucent merged with Alcatel SA of France in 2006, forming Alcatel-Lucent (PAP-00367663). In January 2016, Alcatel-Lucent USA Inc. (ALU) became an indirect subsidiary of Nokia Corporation. The PA/SI/RI Report stated that the transaction through which Nokia Corporation would obtain ownership interest in ALU's ultimate parent corporation, Alcatel-Lucent SA, was expected to be finalized sometime in 2016 (PAP-00367653).

The current owner of the site is RTC Properties. As stated above, Union Minerals and Alloys Corporation purchased the property in 1984. This company is a subsidiary of Neu, Hugo Corp., which changed its name to River Terminal Development Company ("RTC") in 1988 (PAS-00073217).

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3. Operational History/COC Use and Presence at the Facility

Operations

Lucent's 1997 response to an EPA information request stated that the facility manufactured parts (e.g., switchboards and consoles, cables and wire, key equipment, connectors and molding, precious metal plating, sheet metal piece parts, etc.) for electromechanical assembly operations. Operations included plating, cleaning or degreasing, organic coating, and lubrication. The operations generated wastes and used small quantities of containerized chemicals, solvents, coating materials and oils that were stored primarily in workshops and occasionally outdoor storage yards. Auxiliary functions necessary for plant operation, such as a Powerhouse, a Garage, and electrical distribution required fuel tanks and oil containing transformers (PAS-00080505).

According to an Affidavit signed in May 1996 by former employee Mr. Daniel Bartel, the facility manufactured transformers for 25 years. The plant also manufactured copper wire and cables lined with lead and polyethylene (PAS-00080249).

An undated list of the chemicals used in the metal finishing processes at Kearny Works included copper cyanide and lead fluoborate (PAS-00080261).

A 1977 *Spill Control and Countermeasure Plan* for the facility documented the procedures for a welded steel oil storage tank located about 480 feet from the river bulkhead, two feet above grade on a piled concrete foundation, and surrounded by a steel dike. The oil was used to generate steam in the adjacent powerhouse facility. The tank was 60-feet in diameter and 40-feet high and oil was delivered by barge. The plan stated that the tank had been in operation since 1962 and no spills had occurred (PAS-00080375).

Waste Water

Lucent stated in their 1997 response to an EPA information request that waste water was discharged to the municipal sewer from 1925 to 1984 (PAS-00080507). A letter documenting a telephone discussion between Western Electric and the Passaic Valley Sewerage Commissioners (PVSC) on March 8, 1972, stated that all industrial waste water was disposed into the sanitary sewer for treatment at the municipal sewerage treatment plant located in South Kearny on the Hackensack River (PAP-00126611-12).

A 1969 *Report on the Quality of the Interstate Waters of the Lower Passaic River and Upper and Lower Bays of New York Harbor* listed five pipes from Western Electric as discharging directly to the Passaic River in a table titled "Direct Waste Discharges, Passaic River" (PAS-00114005). A 1972 letter documenting a telephone discussion between Western Electric and the PVSC stated the effluent discharged to the Passaic River was from storm drains and the power house cooling water (PAP-00126611-12). According to an *Environmental Information Survey of 1972*, dated June 1, 1973, there were five discharges from the facility containing untreated industrial and sanitary waste to the sanitary sewer, and the additional (sixth) discharge was stated to be to the

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“stream.” This discharge consisted of the untreated “once-through” cooling water used for the power house air conditioning. The survey noted that a waste treatment plant was under construction (PAS-00080294).

Once the on-site water treatment plant was built in 1974, the facility submitted an application for a National Pollutant Discharge Elimination System (NPDES) permit to discharge to the Passaic River. The confirmation of this application stated the wastewater was previously discharged to the municipal sewerage system (PAP-00126621). The NPDES permit NJ 002 0443 was issued with an effective date of April 30, 1974 and expired April 30, 1979 (PAP-00127219). The permit set maximum limits for discharge 002 for total and soluble lead (1.05 and 0.05 milligrams/liter [mg/L], respectively), total and soluble copper (1.2 and 0.2 mg/L, respectively), and volume (1.1 “MGD”) (PAP-00127223).

Six discharges to the Passaic River were identified in the 1974 NPDES permit: A, B, C, D, 001, and 002 (PAP-00127222-23). A letter from Kearny Works to the EPA, dated January 15, 1976, stated Outfall 002 was from the treatment plant, Outfall 001 was from the plant air-conditioning, and Outfalls A, B, C, and D were storm water lines that went through or under the buildings. The four storm water outfalls carried street and parking lot runoff, as well as roof drainage, building sumps, and emergency city water drains. Tide water was stated to run up the full length of these drains (PAP-00126620).

A NPDES permit renewal application for Western Electric Company, dated September 15, 1978, details four of the outfalls from the facility. The outfalls appear to be the same as the outfalls identified above, but the lettered outfalls were numbered instead (PAS-00073224-28).

- Outfall 001 was from the power house and has been used since September 1966. Water was taken from the lower Passaic River and used during the summer months (when the outside temperature is greater than 60 degrees F) to cool the heat exchanges of the air conditioning system prior to discharge back to the river through this outfall (approximately 4,000,000 gallons/day for three months of the year). Municipal water was used for the continuous boiler blowdown (30,000 gallons/day), yearly chemical free cleaning and blowdown of four boilers (100,000 gallons/boiler), and regeneration of water softeners, and then discharged through this outfall (PAS-00073229-31).
- Outfall 004 was continuous surface water from streets, parking lot, and roof drains. It was identified as the “Mdse. Bldg. South Outfall” and noted to have begun in 1925 (PAS-00073239-41).
- Outfall 005 was continuous surface water from streets, parking lot, and roof drains. It was identified as the “Mdse. Bldg. North Outfall” and noted to have begun in 1925 (PAS-00073248-50).
- Outfall 006 was continuous surface water from streets, parking lot, and roof drains. In addition, some cooling water, drinking fountain water, steam condensate, fire mains, and miscellaneous sources of small volumes of clean

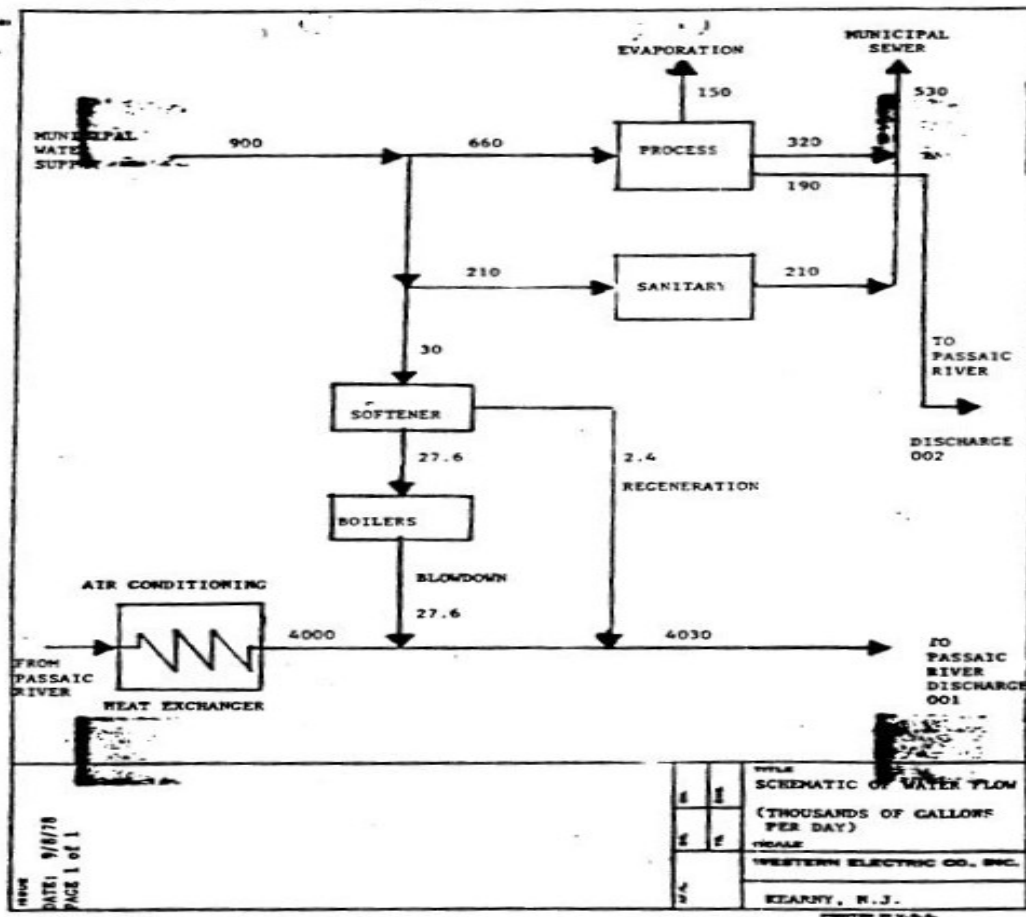
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water were discharged through this outfall. It was identified as the "170-171 Bldgs. Outfall" and noted to have begun in 1925. The previous serial number was 000D (PAS-00073257-59).

The following diagram of the water flow at the facility in 1978 was included in the NPDES application. It showed 190,000 gallons per day were discharged to the Passaic River through Outfall 002, and 4,030,000 gallons per day were discharged to the Passaic River through Outfall 001:



(PAS-00073226)

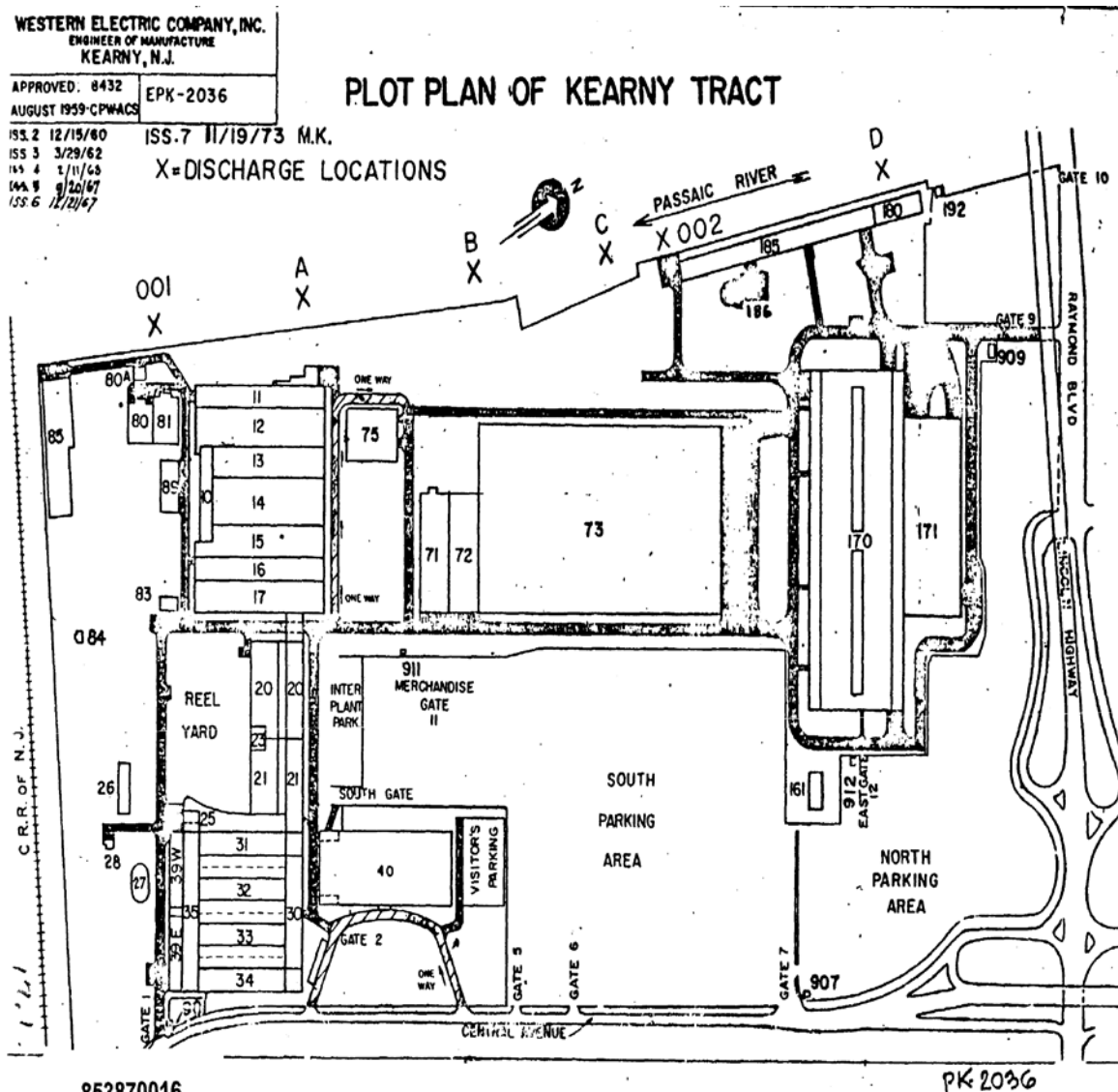
An Affidavit from former employee Mr. Bartel discusses the six outfalls; four from storm sewers, one from the waste water treatment plant, and one from the power plant condenser. The storm sewers were stated to be connected to two drains located within the drum storage area at the southern end of the facility. The Affidavit stated that the waste water treatment plant discharged treated water to the Passaic River, and prior to the construction of the waste water treatment plant in 1973, treated process water was discharged to the Passaic River through storm sewers. The treatment procedures for this waste water were unknown to the employee (PAS-00080249-50).

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Diagram PK-2036 was provided with the 1997 response to an EPA information request and shows the approximate locations of the six outfalls to the Passaic River, which are the "x" locations on the figure below:



853870016
(PAS-00080516)

An undated list of chemicals regularly drained to the city sewers included paint spray booth flocculent, dyes, soap, emulphor (emulsifying agent), wire drawing compound, copper sludge, oil, phosphates, acids, and photographic chemical developers. The list stated it was exclusive of those chemicals intended for the waste treatment plant (PAP-00126613). An undated diagram of the copper plating process showed that rinse water was discharged to a waste treatment pit (PAP-00126618), but it is not clear where the pit was located at the facility and if it was part of the waste water treatment plant.

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According to a memorandum dated April 25, 1977, circuit board cleaner CU-3 and Oakite 90 solution could be disposed into the sanitary sewer sump without treatment (PAP-00126619). In addition, two memoranda dated January 29, and February 2, 1979, state that spent diluted silk screen chemicals were disposed to the sanitary sewer at a rate of ten gallons per week in 1979 (PAP-00126615-16). The documents do not include information for if these discharges contained OU2 COCs.

Hazardous Waste

According to the 1997 response to an EPA information request, the facility was an authorized hazardous waste generator and storage facility under EPA ID No. N.J.D. 002139053 (PAS-00080504). In addition, waste materials were accumulated in an authorized waste yard prior to disposal in accordance with the Resource Conservation and Recovery Act (RCRA). Prior to the issue of RCRA regulations, the facility followed the various company instructions for storage, transfer, use, and disposal of hazardous substances (PAS-00080505-6). A 1961 Hazards-Toxic, Corrosive, and Flammable Materials instruction defined the hazardous materials and handling requirements used to minimize hazards at the plant (PAS-00080278). However, only the first two pages of this plan were available in the file material.

Correspondences from September 1976 discussed the disposal of copper protecting wastes. A Copper Cleaner solution was stated to be a hazardous waste disposed in drums to be shipped off-site. Another flammable chemical solution Redox was stated to contain mostly Stoddard solvent to be disposed as a hazardous waste (PAS-00080295-96).

A letter to a Mr. J.R. Mandel, dated December 7, 1979, described the hazardous material storage areas located outside in the Acid Yard south of 185 Building and the "O.P. yard" south of Building 20. Subdivisions in the Acid Yard included the metal finishing area to the north, an empty drum area, and a "PWB" (acronym was not defined) area to the south. The O.P. Yard included a waste area to the north and a new material area to the south (PAS-00080313).

A memorandum dated November 12, 1979, stated that partially filled drums of hazardous waste had been consolidated at the O.P. yard, but the practice of tipping the drums to pour out the waste was hazardous and would be discontinued in accordance with New Jersey's new spill law (PAS-00080312).

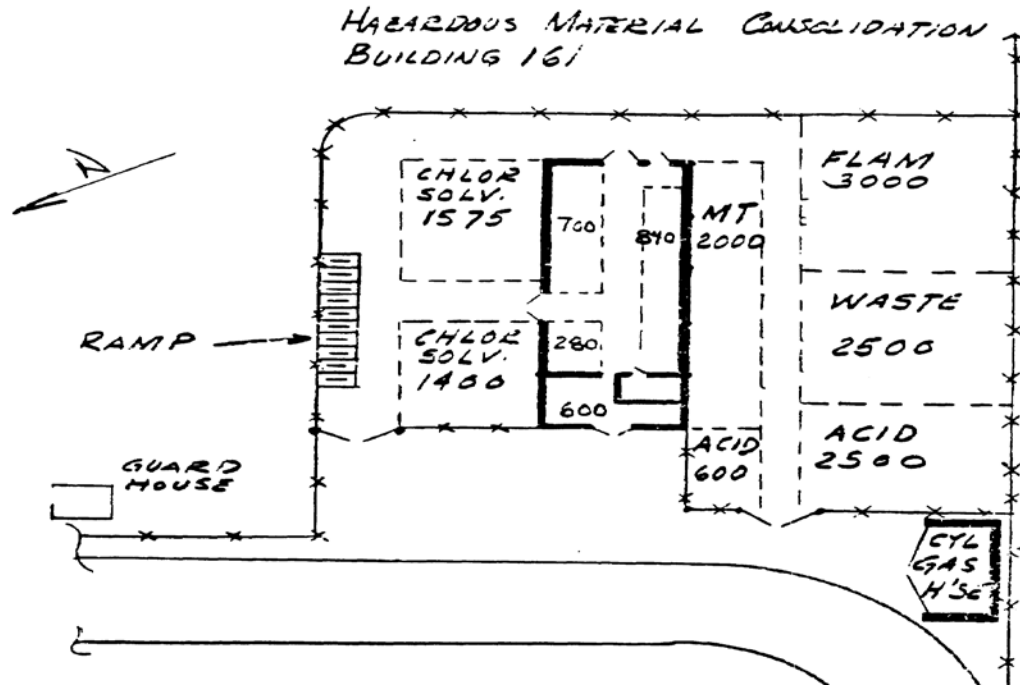
According to hazardous waste survey forms from 1980, in addition to the solvent wastes, the facility produced 3,850 gallons of caustic waste, 2,350 gallons of acid wastes, and 3,700 gallons of solid waste per year (PAS-00080339-44).

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Building 161 appears to have been a consolidation point for hazardous material:



(PAS-00080315)

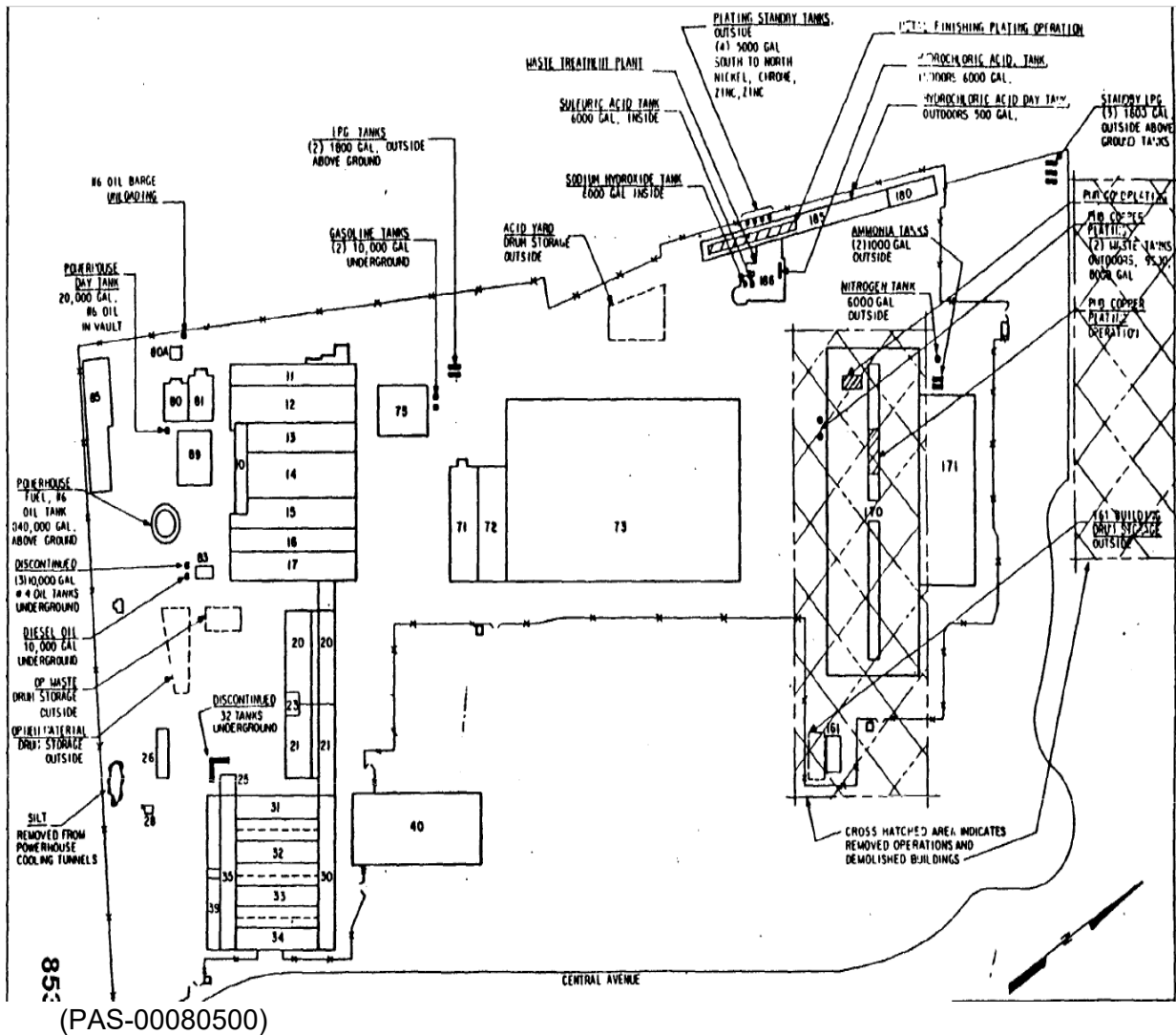
Miscellaneous

An inventory of the facility's storage locations was provided on a grid-based facility map. The list included various oil and gasoline underground and above ground storage tanks, but no spills or leaking tanks were noted. The list also stated that silt pumped from Powerhouse cooling water tunnels was examined for contaminants, found to be "environmentally innocuous" and deposited at Grid Index J-2. Buildings 170 and 161, shown as the cross hatched rectangles at Grid Index 1-15, were environmentally cleaned and demolished in 1981. Building 170 was the former location of copper plating operations. In addition, dried copper-bearing sludge was present on the basement floor of Building 85, which is located near the Passaic River at the southwestern corner of the site. Finally, it was noted that prior to 1963, a large coal pile was maintained in the area defined by Grid Indices F-H-2-3. The weight of the coal probably produced soil settlement, and there may be a thin layer of coal fines under the current gravel surface (PAS-00080497-99).

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4. Identified COCs

- PCBs (used, released)
- PAHs (detected)
- Dieldrin (detected)
- DDx (detected)
- Mercury (used)
- Copper (used, released)
- Lead (used, released)

Lucent stated in their 1997 response to an EPA information request that PCBs, copper, and lead were used at the facility (PAS-00080504).

PCBs

According to an Affidavit from former employee Mr. Bartel, the facility manufactured transformers for 25 years. Although the exact time period for this manufacturing is not specified, Mr. Bartel worked at the Kearny Works from 1952 to 1985 (PAS-00080249).

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No further information for the manufacturing of transformers at the facility was found in the available references.

A Selected Substance Report, dated July 1, 1980, stated PCBs were in fixed transformers and a small stock, but were not used in the production operations (PAS-00080319).

During a 1981 inspection, PCBs were stated to be in the 13 transformers located at the site. The transformers used "pyranol" and "abestol" as the dielectric fluid. Seven transformers were located inside installations and the remaining six were outside. Two of the outdoor transformers were not functional and considered storage tanks. A drum storage area was located inside the basement of Building 32 with a total of 12, 30-gallon drums containing virgin PCB liquid used for transformer make-up (PAS-00080395-96). The transformers used as storage tanks were disposed in 1982, and the drum storage area was moved to the fifth floor of Building 25 to be above the 100-year flood level (PAS-00080456).

A memorandum dated January 8, 1982, stated that all transformers had less than 50 parts per million (ppm) PCBs except four transformers that had 56 to 120 ppm PCBs. Three were located at the wire mill, while the fourth was located at the west end of the row outside "170-S." The four transformers would be disposed as PCB contaminated (PAS-00080419-20).

As presented in the Amended Environmental Cleanup Plan, dated July 1985, soil samples were collected May 2-10, 1985, and the reported maximum detection of total PCBs (89,000 µg/g – or ppm) was at two to three feet at the Kearny Works site. A maximum total PCBs concentration of 33,000 µg/g was reported for surface soil (PAS-00129816-17).

PAHs

The 2016 PA/SI/RI Report attributed most of the concentrations of PAHs in soil to Historic Fill, but noted that PAHs concentrations in soil near Building 170 were likely due to the demolition of Building 170 (PAP-00367770). Building 170 was identified as the former "assembly" building inherited from Ford Motor Company and demolished in 1981 (PAP-00367664).

Dieldrin and DDX

Pesticides were analyzed in soil samples collected and reported in the 2016 PA/SI/RI Report. Dichlorodiphenyltrichloroethane (DDT), Dichlorodiphenyldichloroethane (DDD), and Dichlorodiphenyldichloroethylene (DDE) were detected in site soil at various locations. Maximum concentrations of each were 1,600 micrograms per kilogram (µg/kg) (DDT), 400 µg/kg (DDD), and, 720 µg/kg (DDE). Dieldrin was detected at one background location at a depth of 2.5 to three feet a concentration of 0.0075 milligrams per kilogram (mg/kg) (PAP-00367769, 887-893).

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Metals – Copper, Lead and Mercury

A letter dated October 18, 1977, regarding the transportation of hazardous materials stated that mercury was used in various Kearny products (mercury switches, relays, etc.) (PAS-00080307). In addition, a “residue from printed wiring board land area copper plating” is identified as a hazardous waste generated by the facility in a *Generator Annual Hazardous Waste Report* for 1981 (PAS-00080436).

Characterization of the wastewater treatment plant effluent was documented in a 1981 Wastewater Treatment Plant survey. The average concentrations over the first nine months of 1981 reported total and soluble lead (0.05 mg/L for both) and copper (0.21 and 0.16 mg/L, respectively). The survey noted that there were two instances in 1981 when the NPDES permit levels were not met, but the exceeding parameters and concentrations are not specified. The 9-month averages proceeding the inspection for lead and copper were at or below Permit levels (PAS-00080368-69).

Metals were noted to be present in the waste water generated by the facility, as monitoring of the treatment plant sludge in 1980 through 1982 detected copper and lead at concentrations ranging from 940 to 4,300 mg/kg for copper and 270 to 80,000 mg/kg for lead (PAP-00126742-84). A sample of the sludge filter cake analyzed in 1982 was determined to contain 1.1% copper and 0.44% lead (PAS-00080423). A seven-day composite sample of the sludge filter cake from 1982 detected copper and lead at 2,300 and 2,400 mg/kg, respectively, but the concentrations were based on the wet weight of the sample with 79% moisture (PAS-00080422). According to the Industrial Process Wastewater Sludge Reports from the early 1980s, the sludge was transported to and disposed at the Hackensack Meadowlands Landfill in Kearny, New Jersey (PAP-00126741).

An undated letter stated the waste water treatment sludge produced at the facility from electroplating operations did not have concentrations of contaminants above the RCRA Part 261, Subpart D, “Hazardous Waste from Nonspecific Sources” levels (PAS-00080316). The Selected Substance Report attached to the letter was dated July 1, 1980, and identified contaminants present at the site, including copper and lead, but concentrations were not provided (PAS-00080316-9).

A laboratory report on a sample of “tunnel sludge” collected in 1981 did not have detections of mercury or lead (PAS-00080356).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP¹.

¹Digital Geodata Series, DGS04-7, Historic Fill for New Jersey, <https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm>, Quadrangle No. 53 (NJDEP map identifying locations of recognized historic fill).

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NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury². Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.³ PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards⁴.

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00367853, 57, 66; PAP-00371976).

COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	7,650 mg/kg
Copper	12,000 mg/kg
Mercury	20.5 mg/kg
Benzo(a)anthracene	120 mg/kg
Benzo(a)pyrene	120 mg/kg
Benzo(b)fluoranthene	170 mg/kg
Benzo(k)fluoranthene	62 mg/kg
Dibenzo(a,h)anthracene	22 mg/kg
Indeno(1,2,3-cd)pyrene	81 mg/kg

The 2016 PA/SI/RI Report attributed the widespread PAHs and metals contamination detected across the site to Historic Fill. To support this conclusion, the PA/SI/RI Report established a historic fill profile that would be used to evaluate results in operating areas of the site where AOCs are located. In addition, fill material was observed to be present in 210 of 220 soil borings installed (PAP-00367723-24, 31-34). The PA/SI/RI Report also stated: "The average lead concentration is substantially higher in topsoil than in either fill material and likewise provides a strong indicator for DAP [diffuse anthropogenic pollution], as the most likely source for lead in surface soils is historic emissions associated with leaded gasoline, particularly given the vicinity of the Site to Route 1 and 9 bypass (Lincoln Highway), Pulaski Skyway, New Jersey Turnpike and other high-volume, long standing roadways" (PAP-00367737); indicating that elevated lead concentrations are possibly not site-related, but anthropogenic.

² *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes in New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

³ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

⁴ NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: - PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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Historic Fill at the site was likely disturbed during construction and demolishing of the plant's buildings. In addition, the excavations performed in 1985 likely disturbed the Historic Fill. A Classification Exception Area / Well Restriction Area (CEA/WRA) associated with Historic Fill was established December 18, 2018 (PAP-00373377). The CEA/WRA was identified for PAHs and metals, including lead and mercury (PAP-00373323, 26).

5. COC Pathways

Sanitary Sewer

Lucent stated in their 1997 response to an EPA information request that waste water was discharged to the municipal sewer from 1925 to 1984 (PAS-00080507). A letter documenting a telephone discussion between Western Electric and the Passaic Valley Sewerage Commissioners (PVSC) on March 8, 1972 stated that all industrial waste water was disposed into the sanitary sewer for treatment at the municipal sewerage treatment plant located in South Kearny on the Hackensack River (PAP-00126611).

An *Environmental Information Survey of 1972*, dated June 1, 1973, discussed the water flow at the facility in 1972. The Survey stated that 1,710,000 gallons of city water and 8,000,000 gallons of water from the Passaic River were used at the facility each day. The river water was stated to be used as air-conditioning cooling water. The once-though, untreated cooling water for the power house air conditioning plant was then discharged to the river, while the rest of the plant's wastewater was discharged to the sanitary sewer. The levels of oil and grease in this discharge exceeded the acceptable levels in the Kearny sewer code for 3 of 5 days. In addition, copper was detected at a "significantly high" concentration (not specified), but the Kearny sewer code did not have a standard for this metal. It was noted that copper was from various plating operations that were planned to be transferred to a new centralized plating facility with a water treatment plant (PAS-00080294).

A NPDES permit application for Western Electric Company, dated September 15, 1978, stated 320,000 gallons per day of process water and 210,000 gallons per day of sanitary water were discharged to the municipal sewer (see the diagram associated with this permit application in Section 3 [Operational History/COC Use and Presence at the Facility]) (PAS-00073226).

A Selected Substance Report dated July 1, 1980, documented the water flow at the facility in 1980. The estimated average daily volume of wastewater discharged to the sanitary sewer was 500,000 gallons. The discharge included process water, non-contact cooling water, and domestic sewage (PAS-00080319).

An undated list of chemicals regularly drained to the city sewers included paint spray booth flocculent, dyes, soap, emulphor (emulsifying agent), wire drawing compound, copper sludge, oil, phosphates, acids, and photographic chemical developers. The list stated it is exclusive of those chemicals intended for the waste treatment plant (PAP-00126613).

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Storm Sewer

According to a 1996 Affidavit from former employee Mr. Bartel, who worked at the facility as a plumber, waste lines from two buildings were connected to the facility's storm sewer. Mr. Bartel stated that prior to the construction of the waste water treatment plant, treated process water was discharged to the Passaic River through storm sewers. The treatment procedures for this waste water were unknown to Mr. Bartel. In addition, Mr. Bartel noted that there were two drains to the storm sewer from the hazardous waste storage areas at the southern end of the facility (PAS-00080249-50).

Lucent's 1997 response to an EPA information request stated that air conditioning drains, water sumps and water fountain effluent were drained to storm sewer outfalls to the Passaic River. Storm sewers contained runoff oil and grease (PAS-00080507).

Direct Release

According to a 1969 *Report on the Quality of the Interstate Waters of the Lower Passaic River and Upper and Lower Bays of New York Harbor*, Western Electric was listed as having five pipes that discharged directly to the Passaic River (PAS-00114005). A 1972 letter documenting a telephone discussion between Western Electric and the PVSC stated the effluent discharged to the Passaic River was from storm drains and the power house. The effluent was specified to contain the power house cooling water (8 million gallons per day), boiler blowdown (25,000 gallons per day), as well as periodic regenerated water from the water softeners (4,000 gallons) (PAP-00126611-12). This was also stated by an *Environmental Information Survey of 1972*, dated June 1, 1973, which identified 8 million gallons of water from the Passaic River used at the facility each day as air-conditioning cooling water, and that the once-through, untreated cooling water for the power house air conditioning plant was discharged to the river (PAS-00080294).

In 1974, approximately one-third of the waste water flow was diverted to the new on-site industrial waste treatment plant, which discharged treated effluent to the Passaic River under a NPDES permit, according to the 1997 response to an EPA information request. The treatment plant had acid/alkali neutralization, chrome reduction, and cyanide destruction followed by solids removal. The sludge from the solids removal was stored on-site and later sent to landfills. Lucent's response states that waste was not treated on-site prior to 1974; however, some waste was sent to disposal or recycling firms (PAS-00080507).

A 1996 Affidavit from a former employee stated that the waste water treatment plant discharged treated water to the Passaic River, and prior to the construction of the waste water treatment plant, treated process water was discharged to the Passaic River through storm sewers. The treatment procedures for this waste water were unknown to the employee (PAS-00080249-50).

As discussed in Section 3 (Operational History/COC Use and Presence at the Facility) above, the facility had six permitted outfalls to the Passaic River, including the power house cooling water, industrial waste treatment plant discharge, and four "run-off, oil and grease" outfalls (PAS-00080508), shown above on diagram PK-2036 (PAS-00080516).

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The four runoff discharge outfalls were primarily storm water drainage and were monitored with samples collected from manholes, except for one that was located in the 12 building basement below the old Cable Shop (PAS-00080421). The storm water drains were stated to be connected to street and parking lot runoff, roof drainage, building sumps, and emergency city water drains, according to a letter from Western Electric to EPA, dated January 15, 1976. Tide water was stated to run up the full length of these drains (PAP-00126620).

A NPDES permit renewal application dated September 15, 1978 stated three surface water outfalls began in 1925 (PAS-00073239, 48, 57), which is when operations at the plant began. Outfall 001 from the power house was noted to have been used since September 1966 (PAS-00073229). The 1978 NPDES application stated that 190,000 gallons per day were discharged to the Passaic River through Outfall 002 (PAS-00073226).

A Selected Substance Report dated July 1, 1980, documented the water flow at the facility in 1980. The estimated average daily volume of treated wastewater discharged to the Passaic River was 250,000 gallons and included process water, contact cooling water, and scrubber water. The form stated the water was treated by destroying cyanide, reducing chrome, neutralizing acid-alkalis, and precipitating metals (PAS-00080319).

According to a 1981 Wastewater Treatment Plant survey, the average flow through the plant was approximately 56,000 gallons per day during the period of October 1 through 28, 1981 (PAS-00080368).

During remediation of the site, eleven drains from the former concrete drum storage pad were found (PAS-00129850). Remediation of the concrete pad stated catch basins associated with the pad were cleaned (PAS-00129860).

6. Regulatory History/Enforcement Actions

Permits

The NPDES permit NJ 002 0443 had an effective date April 30, 1974 and expired April 30, 1979. Discharge limits for temperature and pH were specified for the five outfalls to the Passaic River, and it was stated that the poundage of metals in the effluent should equal the poundage in the intake water. Daily and maximum limits for outfall 002 from the treatment plant were specified for metals (see table below), and a maximum volume of 1.1 MGD was identified.

Contaminant	Daily Maximum per 0.1 MGD (pounds/day)	Maximum (mg/L)
Total Copper	1.00	1.2
Soluble Copper	0.167	0.2
Total Lead	0.876	1.05
Soluble Lead	0.042	0.05

(PAP-00126620; PAP-00127219, 22-23)

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A NPDES permit renewal application for Western Electric Company was dated September 15, 1978 (PAS-00073224).

NPDES permit number 0020443 for the facility was effective August 1, 1979 through June 30, 1981. In addition to a maximum flow limit of 1.1 MGD, the following limits were specified for outfall 002:

Contaminant	Daily Maximum Load Limit per 0.1 MGD (pounds/day)	Daily Maximum Concentration (mg/L)
Total Copper	0.834	1.0
Soluble Copper	0.167	0.2
Total Lead	0.834	1.0
Soluble Lead	0.042	0.05

(PAP-00127237-39)

According to an Affidavit of Exemption from the New Jersey Pollutant Discharge Elimination System, dated June 28, 1985, Permit NJPDES 0020443 was administratively extended past June 30, 1981 and allowed the discharge of industrial surface water to the waters of the State of New Jersey through December 31, 1985 (PAS-00080494-95).

In March 1981, a permit from the NJDEP authorized discharge from the Western Electric Co to the Passaic River in accordance with the New Jersey Discharge Elimination System Regulations (PAP-000127252). It is not clear what discharge was authorized by this permit.

According to the 1997 response to an EPA information request, the facility was an authorized hazardous waste generator and storage facility under EPA ID No. N.J.D. 002139053 (PAS-00080504). In addition, waste materials were accumulated in an authorized waste yard prior to disposal in accordance with the Resource Conservation and Recovery Act (RCRA). Prior to the issue of RCRA regulations, the facility followed the various company instructions for storage, transfer, use, and disposal of hazardous substances (PAS-00080505). A 1961 Hazards-Toxic, Corrosive, and Flammable Materials instruction defined the hazardous materials and handling requirements used to minimize hazards at the plant (PAS-00080278). However, only the first two pages of this plan were available in the file material.

Inspections

An inspection of the waste water treatment plant was performed in October 1981. The average water flow through the plant was approximately 56,000 gallons per day. The inspection report stated that the printed wiring board operations in the 170 building had been discontinued, so the majority of the treated water was from the 185 building. The waste water treatment plant contained acid-alkali neutralization, chrome reduction, cyanide destruction, solids removal, and sludge dewatering systems. One sludge pump had leaked and was being replaced (PAS-00080368-70).

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A RCRA and PCB Inspection was performed October 27, 1981. The RCRA inspection concluded that Kearny Works satisfactorily met the RCRA requirements for a hazardous waste generator and storage location. However, weaknesses were identified in the hazardous waste storage area. The area had a large drain at the center that could be opened with a valve to drain rainwater to the river within four hours after a heavy rain. The inspection noted that the collection system for spills could allow hazardous waste into the storm drain. Roofing was recommended to keep rainwater off the drums. In addition, the drain system valve could be a problem in freezing weather, and the asphalt pad was cracked but should be impervious (PAS-00080394-95). The PCB inspection found several areas of non-compliance, including unlabeled transformers and drums, inadequate roofing over two transformers, a storage area below the 100-year flood level, and transformers and storage areas without dikes (PAS-00080396). A December 8, 1981, memorandum stated these issues were resolved with a new storage area located on the fifth floor of Building 25 (PAS-00080397).

NJDEP inspected the Kearny Works facility on November 19, 1981. A *Memorandum for Record* stated that the inspection concluded that the facility was in compliance with the existing water pollution laws and the facility spill plans were satisfactory. One request was made to address the potential for spills from acid carboys stored on pavement south of Building 185 to reach groundwater (PAS-00080373).

A *Compliance Monitoring Report* dated October 1, 1982 documented a Preliminary Inspection performed February 3, 1982 and an Effluent Survey performed April 28-29, 1982. The inspection reviewed the facility's self-monitoring results and found outfall 002 out of compliance for soluble copper one time in the previous year (PAP-00127263). The report concluded that the facility was in compliance with the terms and conditions of the NPDES permit (PAP-00127254-63).

A RCRA and PCB Survey was performed June 20 and 23, 1983. The RCRA survey identified minor issues with the storage facility (valves in the curbing around the storage pad were left open), but concluded the RCRA program was satisfactory. The PCB survey noted 11 transformers in use. The two transformers in outside storage at the south side of Building 170 were removed and disposed in Emelle, Alabama, on September 29, 1982. The storage area on the fifth floor of Building 25 had ten 30-gallon drums and two partial drums of virgin PCB liquid. The PCB program was concluded to be in compliance with applicable TSCA regulations (PAS-00080455-6). A waste treatment plant survey was conducted June 21 and 23, 1983. The plant treated 120,000 gallons of water each day. The clarifier effluent was noted to be very clear, and no violations of the NPDES permit levels had occurred since the previous inspection in 1981 (PAS-00080457-9).

Violations

An *Environmental Information Survey of 1972*, dated June 1, 1973, stated the levels of oil and grease in the discharge to the sanitary sewer exceeded the acceptable levels in the Kearny sewer code for 3 of 5 days. In addition, copper was detected at a "significantly high" concentration (not specified) in 1972, but the Kearny sewer code did not have a standard for this metal (PAS-00080294).

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A letter dated September 12, 1977, to Western Electric Company from EPA stated the results presented in the previous Discharge Monitoring Report exceeded the NPDES effluent limitations (PAS-00073276). A response letter from Western Electric Company addressed the exceedances, indicating the oil and grease and cyanide concentrations were reported as not detected (less than the reporting limits), and stated that the dissolved lead concentration was reported as 0.02 minimum to 0.03 maximum (no unit specified), which did not exceed the permit limit of 0.05 (PAP-00127236).

An inspection report noted that there were two instances in 1981 when the NPDES permit levels were not met, but the exceeding parameters and concentrations were not specified. The average concentrations over the first nine months of 1981 for lead and copper were at or below the permit levels. The maximum permit limits for total and soluble lead were identified as 1.0 and 0.05 mg/L, respectively, and total and soluble copper were 1.0 and 0.2 mg/L, respectively (PAS-00080369).

A *Compliance Monitoring Report* dated October 1, 1982 stated outfall 002 was out of compliance for soluble copper one time in the previous year. The concentration of soluble copper that exceeded the criterion in the previous year was not specified. A sample collected at this outfall point detected soluble copper at 0.08 mg/L, which was less than the permit daily maximum limit of 0.2 mg/L. Total copper was 0.09 mg/L in the sample from this outfall, which was less than the permit daily maximum of 1.0 mg/L, and lead was not detected (PAP-00127263, 65).

7. Response Actions

Characterization Activities

The following is a list of major response action documents identified in the available file material:

- Environmental Evaluation Measurement Plan, dated May 1984 (PAP-00371663)
- Environmental Cleanup Plan, dated October 1984 (PAP-00371683)
- Environmental Cleanup Plan, dated November 1984 (PAP-00371772)
- Amended Environmental Cleanup Plan, dated July 1985 (PAS-00129806)
- Addendum to Amended Environmental Cleanup Plan, dated June 21, 1985 (PAS-00129820)
- Certification of ECRA Soil Cleanup, dated January 1986 (PAP-00372057)
- Certification of ECRA Soil Cleanup, dated February 1986 (PAP-00372075)
- Supplemental Preliminary Assessment/Site Investigation/Remedial Investigation Report (PA/SI/RI Report), dated May 2016 (PAP-00367644)

Soil

Remediation under NJDEP began in 1985 (PAS-00080506), when the site was owned by RTC. Cleanup was part of the New Jersey's Environmental Cleanup Responsibility Act (ECRA) Program due to the cessation of operations and sale of the property (PAS-00129775).

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According to the 2016 PA/SI/RI Report, excavations were performed in 1985 and included the removal of 31,915 cubic yards of soil from a total area of 477,775 square feet, as well as cleaning out 18 catch basins (PAP-00367667). Completion of these excavations was reported in the *Certification of ECRA Soil Cleanup*, dated January 1986 (PAP-00372057). The planned excavation areas were determined in the *Amended Environmental Cleanup Plan*, dated July 1985 using action criteria for several parameters, including copper (170 mg/kg), lead (400 mg/kg), and PCBs (5 mg/kg) (PAP-00371881-2). This Plan attributed PCB contamination in soil at Areas 11, 12, 21, and 22 to the transformers at Buildings 21 and 170, and the surface soil PCB contamination at Areas 4, 5, and 6 to a concrete pad that was formerly used for storage of chemicals and petroleum products (PAP-00371886-89).

The following table shows the maximum concentrations of each COC, if analyzed, for each area identified for excavation, as well as the volumes of soil planned for excavation based on the action criteria. The table is adapted from Tables 2-2, A-1, A-6, A-7, and A-12 from the Amended Environmental Cleanup Plan, dated July 1985 (clean-up locations and volumes and results for contaminants sampled in each area; PAP-00371884, 931-47, 963-65, 976).

Excavations Planned in 1985				
AOC	Volume removed (cubic yards)	Maximum Lead (ppm)	Maximum Copper (ppm)	Maximum PCBs (ppm)
1	1,667	790	620	
2	463	760	600	
3	630	610	270	
4,5,6	7,424 (7,320 +104)	1,200	1,110	3,800
7	167	710	210	
8A,8B	974 (830+144)	360	450	
9	93	290	250	
11A,11B	1,068 (370+698)			89,000
14	89	1,200	240	
15*	889			
16,17	1,333	3,000	2,300	
21,22A	511 (459+52)	700	160	32.3
25	556	1,100	150	
26	89	290	170	
31	93	510	230	
33	6,963	2,000	12,000	
34	6,074	1,200	1,800	
37,38	796	1,400	600	
39	203	350	130	
44-2	36	520	130	
45-1,45-5*	904 (830+74)			
47	889	460	68	

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Excavations Planned in 1985				
AOC	Volume removed (cubic yards)	Maximum Lead (ppm)	Maximum Copper (ppm)	Maximum PCBs (ppm)
<i>Historic Fill Averages</i>		574	11.2	
<i>Historic Fill Maximums</i>		10,700	92.9	

Blank cells indicate no analyses were performed for the contaminant.

*These AOCs did not have samples analyzed for COCs (PAP-00371931-47, 63-65, 76).

Note: the 2016 PA/SI/RI Report attributed metals contamination in site soil to historic fill (PAP-00367723). The maximum concentrations of lead in soil are all less than the maximum concentrations in historic fill. With the exception of AOC 47, copper concentrations at each area exceed the historic fill maximum concentration.

As documented in the 2016 PA/SI/RI Report, the site received No Further Action (NFA) status from NJDEP for all of the ECRA Areas of Concern (AOCs) identified in 1985 (AOCs 1 through 47), with the exception of the Former Drum Storage Area (AOC 4, 5, 6). The 2016 PA/SI/RI Report provided four closure letters from NJDEP in Appendix G, including the following:

- June 26, 1987; NJDEP states that Section 2 (Soil Cleanup) of the approved Cleanup Plan is complete (PAP-00372094).
- June 23, 1994; NJDEP states that NFA is acceptable for all soil areas of concern except Area 4-6 and ATT11 (PAP-00372095).
- July 8, 1997; NJDEP states that NFA is approved for the 20,000-gallon No. 6 fuel oil UST at Building 80 (PAP-00372098). The PA/SI/RI Report identifies this as AOC 8A (PAP-00367773).
- March 26, 1999; NJDEP states that NFA is approved for one 4,000-gallon gasoline UST and one 4,000 gallon diesel fuel UST (PAP-00372099). The PA/SI/RI Report identifies this as AOC 15 (PAP-00367774).

The 2016 PA/SI/RI Report identified additional AOCs at the site, and conducted investigations at several ECRA AOCs to confirm that remediation was performed to current standards (PAP-00367654, 70-73). It was concluded that the PAHs and metals detected in soils across the site could be attributed to Historic Fill (see discussion above), and most sites did not require further action. The following table defines the AOCs investigated in the PA/SI/RI, as well as the COCs for which further action was proposed.

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Status of Soil at AOCs after 2016 PA/SI/RI			
AOCs	Description	AOCs with NFA Proposed	AOCs with Further Action Proposed (COCs)*
1, 2, 3, 19, 20, 24, 25, 26, 27, 28, 29, 30, 31	Exposed, disturbed soils containing demolition rubble or other materials	1, 2, 3, 19, 20, 24, 25, 26, 27, 28, 29, 30	31 (PCBs)
4/5/6, 16/17, 37/38, 39, 58	Former Drum Storage Areas	37/38, 39	4/5/6 (PCBs-as part of AOC 75) 16/17 58 (PCBs-as part of AOC 31)
7, 12, 15, 71	USTs	15, 71	7 (naphthalene) 12
8A/8B	Building 80 & 81 Powerhouse Day Tank and Drum Storage Area	8A/8B	
11A/B, 21/22A, 21/22B, 50, 62	Transformers	21/22A, 21/22B, 50, 62	11A/B (PCBs)
14	Undisturbed background; area never subject to development or site operations	14	
18	Liquid Chemical Transfer Location	18	
43, 44, 45, 47	ECRA Unoccupied Areas	43, 44, 45, 47	
48/49	ECRA (unknown concern)	48/49	
51	Former Chilled Water System	51	
52	Powerhouse Coal Fines	52	
53	Building 170 Plating Operations	53	
54	Building 170 Outdoor Waste Tanks	54	
55	Subsurface Plating Waste Lines	55	
56A, 56B	Liquefied Petroleum Gas ASTs	56A, 56B	
57	Former Pond	57	
59	Fuel Oil Tanks	59	
61	Building 185 Plating Standby Tanks	61	
63	Historic Rail Lines, Loading/Unloading Areas	63	
64	Historic Fill	64	
65, 66, 67	Manufacturing Buildings	65, 66, 67	
68	Lumber Storage Shed	68	
70	Powerhouse Buildings 80, 80A, & 81	70	
74	Waste Water Treatment Plant	74	
75	Historical Release		75 (PCBs)
76	Historic Pesticide Use		76
AOC Ford-1	Machine/Paint/Varnish/Body Assembly Buildings	AOC Ford-1	
AOC Ford-2	Print Shop, Chemical Storage – Assembly Plant East	AOC Ford-2	
AOC Ford-3	Chemical Storage - Assembly Plant East	AOC Ford-3	

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Status of Soil at AOCs after 2016 PA/SI/RI			
AOCs	Description	AOCs with NFA Proposed	AOCs with Further Action Proposed (COCs)*
AOC Ford-4	Automobile Assembly Building and Boiler Room	AOC Ford-4	
AOC Ford-5	Chemical Storage	AOC Ford-5	
AOC Ford-6	Boiler Room and Coal Storage	AOC Ford-6	
AOC Ford-7	Ford Assembly Building/Western Electric Company Building 170		AOC Ford-7 (PAHs, PCBs, metals)
AOC Ford-8, -9	Storage Buildings	AOC Ford-8, -9	
AOC Ford-10	Ford Warehouse Building	AOC Ford-10	
AOC Ford-11	Ford Rail Lines, Load/Unloading Operations	AOC Ford-11	

*No contaminants are identified if additional investigation is proposed for non-COCs. (PAP-00367772-791, 800-801)

At AOC 4/5/6, Former Drum Storage Area, ongoing investigations have been performed since it was initially excavated in 1985, including additional source area excavation and soil vapor extraction through 1993. The PA/SI/RI Report collected additional soil samples and concluded that the metals and PAHs detections were related to Historic Fill. Total PCBs detected at Area B9-6-1 are proposed to be addressed as part of AOC 75 (PAP-00367739-42).

AOC 7 included three 10,000-gallon No. 4 oil and diesel fuel USTs located south of Building 17 and below a paved parking area and roadway adjacent to recently constructed Building 19. Tanks 0001 and 0002 were abandoned in place around 1970, while Tank 0003 was abandoned in place on August 22, 2000. Results reported in the PA/SI/RI Report show naphthalene was detected in soil at a maximum concentration of 40 mg/kg (PAP-00367743-744, 837).

AOC 11 A/B was the location of an historical release of PCB-containing transformer fluids. Excavation was performed in 1985 to a depth exceeding 10 feet below ground surface (ft bgs) immediately adjacent to the Building 21 loading dock and along a former railroad line. The PA/SI/RI Report collected additional soil samples and PCBs were detected up to a concentration of 0.42 mg/kg (PAP-00367747-48, 990).

AOC 31 was an area of demolition rubble or other materials near former Building 170 and was previously excavated to 0.5 ft bgs under ECRA. The PA/SI/RI Report collected additional soil samples and concluded that the metals and PAHs detections were related to Historic Fill. Total PCBs were detected up to a concentration of 3.6 mg/kg (PAP-00367757-758, 998).

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AOC 58 is the former Building 161 Drum Storage Area located south of Building 161 and an Oil Heater formerly located inside of Building 161. The function of the oil heater and contents of the drums were not known, but assumed to be related. The PA/SI/RI Report collected soil samples and concluded that the metals and PAHs detections were related to Historic Fill. PCBs detected AOC 58 were proposed to be addressed as part of AOC 31 (PAP-00367759-60, 64).

AOC 75 is comprised of several separate areas where PCBs were detected in areas located away from any likely historical operation and at concentrations that are not consistent with Historic Fill. At Area A5-2-1, total PCBs were detected up to 8.18 mg/kg; at Area B9-6-1, PCBs were detected up to 0.71 mg/kg; at Area C10-4-1, total PCBs were detected up to 3.9 mg/kg; at Area D7-5-1, total PCBs were detected up to 41.4 mg/kg; and at Area 17-2-1, PCBs were detected up to 0.671 mg/kg (PAP-00367764-69, 8003-8005).

AOC 76 refers to the past use of pesticides at the site. The following maximum concentrations were detected in site soil: DDT at 1.6 mg/kg, DDE at 0.72 mg/kg, and DDD at 0.4 mg/kg. Dieldrin was detected in one sample at a concentration of 0.0075 mg/kg (PAP-00367769, 887-889).

AOC Ford-7 is the location of the former Ford Assembly Building and Western Electric Building 170. It was the site of numerous historical manufacturing and assembly operations prior to its demolition in 1981. The PA/SI/RI Report attributed the detections of PAH, metals, and PCBs in soil to demolition materials related to Building 170. Maximum detections of COCs included PCBs at 1.39 mg/kg, copper at 201 mg/kg, lead at 1,000 mg/kg, mercury at 2.6 mg/kg, and PAHs up to 20 mg/kg (benzo(a)anthracene). (PAP-00367769-7771, 7850, 7869-70, 8006).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

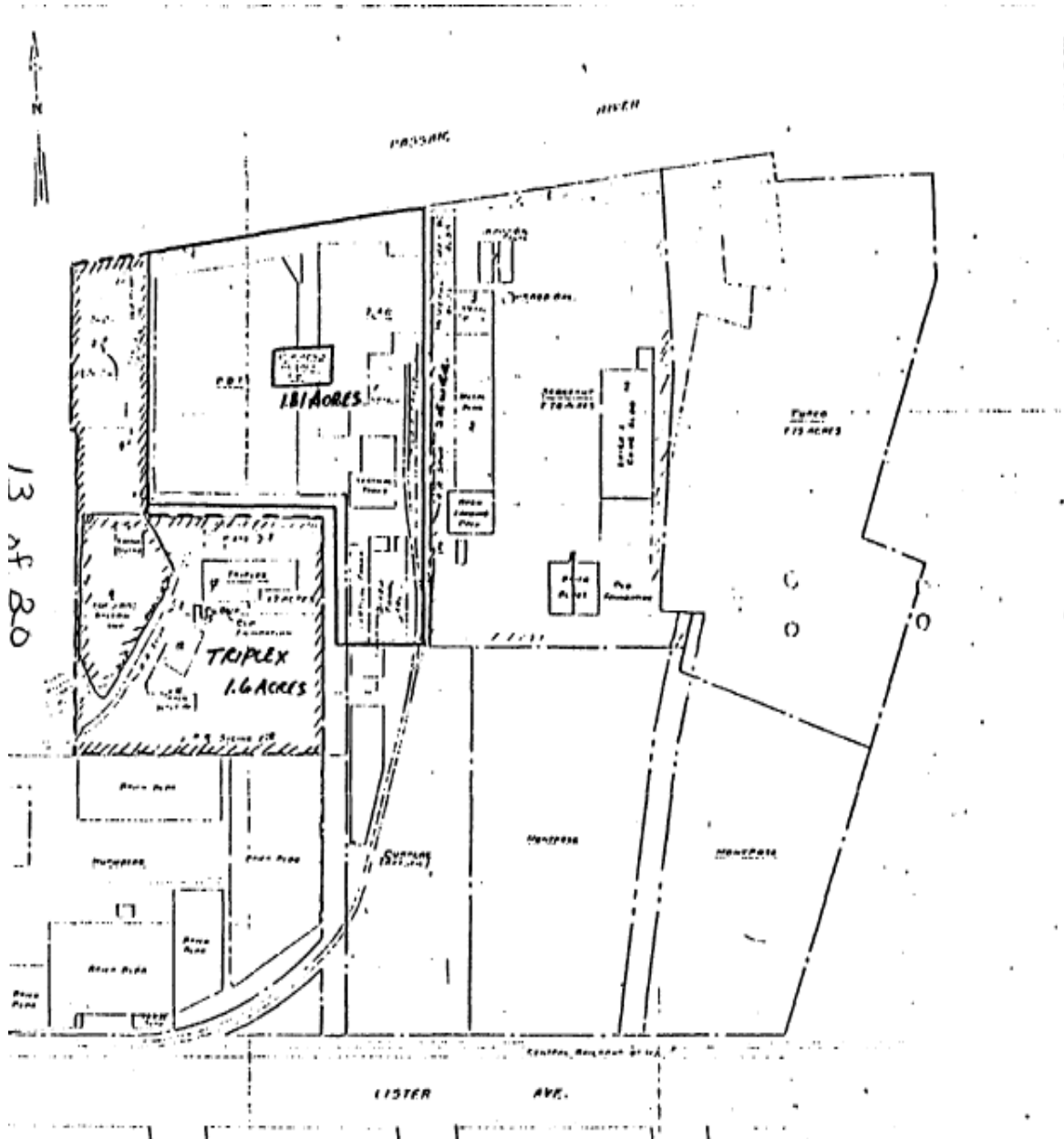
Occidental Chemical Corporation

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OCCIDENTAL CHEMICAL CORPORATION

Facility Name, Address and Size: Occidental Chemical Corporation (OCC), 80 and 120 Lister Avenue, Newark, NJ. The 80 Lister Avenue property is comprised of approximately 3.4 acres on the north side of Lister Avenue consisting of an approximately 1.81-acre parcel and an approximately 1.6-acre parcel (PAS-00126895, PAS-00126915). See the map below. The 120 Lister Avenue portion consists of an additional 2.2 acres (PAS-00091776) (80 and 120 Lister Avenue are collectively referred to herein as the Lister facility).



(PAS-00128481)

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Occidental Chemical Corporation

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1. Business Type: Chemical Manufacturing

2. Time Period of Ownership/Operations

Operator: February 1946–August 1969
Owner 80 Lister 1.81-acre parcel: February 1946–March 1971;
January 27, 1986–August 1986
Lessor 80 Lister 1.6-acre parcel: August 1957–March 1971
Owner 80 Lister 1.6-acre parcel: January 27, 1986–August 1986
Owner 120 Lister 2.2-acre parcel: April 19, 1984–August 1986

In 1946, American Agricultural Chemical Company subdivided the 80 and 120 Lister Avenue properties along the present property boundaries and sold the parcels. The 1.8-acre parcel (the northeast portion of the present site) was acquired by the Kolker Chemical Works, Inc. (Kolker), which operated it as an agricultural chemicals plant (PAS-00126895-96; PAP-00026393). Kolker operated the facility at 80 Lister Ave. from February 1946 until March 1951 (PAP-00159316; PAS-00126897). Diamond Alkali Company (later Diamond Shamrock Chemicals Company) operated the facility from March 1951 to March 1971 (PAP-00143159; PAS-00126897).

According to a Memorandum of Lease, starting July 29, 1957, Diamond Alkali Company leased the 80 Lister 1.6-acre parcel from Triplex Oil Refining Company, Inc. (PAP-00403492-94). Manufacturing ceased August 1969 (PAP-00143159). In March 1971, the 1.8-acre parcel was purchased by Chemicaland Corporation (PAS-00126899). Also in March 1971, the 1.6-acre parcel was sold to Walter Ray Holding Company and the lease for the parcel was assigned to Chemicaland Corporation (PAS-00128470; PAS-00126899).

A *1983 Overview of the History and Operations of the Site* prepared by Diamond and provided to the New Jersey Department of Environmental Protection (*1983 History and Operations Overview of Lister Avenue Facility*), states that after the plant and property were sold to Chemicaland “[i]t appears the plant was involved in the production of benzoic acid, with a small amount of 2,4,-D being manufactured for Diamond Shamrock for a limited time.” (PAS-00128470; PAS-00126899–900).

According to the *February 1985 Site Evaluation for 80 Lister Avenue* prepared by Diamond Shamrock Chemicals Company for the New Jersey Department of Environmental Protection (*1985 80 Lister Avenue Site Evaluation*), “[i]n November 1976, while [Occidental Chemical Company was] considering acquisition of Chemicaland, [it] assumed control of the management of the plant and continued to manage the plant until February 24, 1977, when [it] returned control of the plant to Chemicaland. Because Chemicaland did not have the resources to continue operating without the support of Occidental, they laid off all plant personnel and shut down the plant as it was on the morning of February 24, 1977.” (PAS-00126900).

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William Leckie (the successor to Walter Ray Holding Company) purchased the plant and 1.8-acre property at a tax sale in 1980 and held the premises until 1981. Walter Ray Holding Company sold the property in early 1981 to Marisol, Inc. (PAS-00128470; PAS-00126900). According to the 1985 80 Lister Avenue Site Evaluation “[l]ittle is known of the use of the property by Marisol, but eventually this company started cleaning and clearing the site.” (PAS-00126901). Regarding the cleanup, the 1985 80 Lister Avenue Site Evaluation states: “[t]he product left in the equipment when the plant was shut down on February 24, 1977, was removed and placed in drums, of which 570 remain on site today”; [s]ome equipment known to be on site following the site was removed”; “[w]arehouse space and tankage was leased to SCA Corporation which used it in conjunction with waste disposal operations at their neighboring plant.” (PAS-00126901).

As documented by a deed dated April 19, 1984, Diamond Shamrock Chemicals Company acquired the property located at 120 Lister Avenue from E. M. Sergeant Pulp and Chemical Co., Inc. to assist with the cleanup of the Site (PAP-00403442; PAS-00091776). Similarly, according to a deed, Diamond Shamrock Chemicals Company acquired the plant and property at 80 Lister Avenue from Marisol, Inc. on January 27, 1986 (PAP-00403433).

According to the Administrative Settlement Agreement and Order on Consent for Removal Action between EPA and Occidental Chemical Corporation and Tierra Solutions, Inc., the entity which operated the Diamond Alkali Facility from 1951 to 1969 was Diamond Alkali Company. It changed its name in 1967 to Diamond Shamrock Corporation, and again in 1983, to Diamond Shamrock Chemicals Company. Also in 1983 a corporation named Maxus Energy Corporation (“Maxus”) became the owner of Diamond Shamrock Chemicals Company’s stock (PAS-00033288; 296).

A 1989 signed Consent Decree between the United States, the State of New Jersey, Occidental Chemical Corporation, and Chemical Land Holdings, Inc. (1989 Consent Decree) states that on “September 4, 1986, Diamond Shamrock Corporation sold all the outstanding stock in Diamond Shamrock Chemicals Company to Oxy-Diamond Alkali Corporation, a wholly-owned indirect subsidiary of Occidental Petroleum Corporation. Diamond Shamrock Chemicals Company was then renamed Occidental Electrochemicals Corporation. Title to the Site had previously been transferred by way of an intra-holding company transaction to Diamond Shamrock Chemical Land Holdings, Inc., a wholly-owned indirect subsidiary of Diamond Shamrock Corporation. Effective November 30, 1987, Occidental Electrochemicals Corporation was merged into Occidental Chemical Corporation, a wholly-owned indirect subsidiary of Occidental Petroleum Corporation. On December 4, 1987, the name of Diamond Shamrock Chemical Land Holdings, Inc. was changed to Chemical Land Holdings, Inc.” The 1989 Consent Decree also notes that Chemical Land Holdings, Inc., was a subsidiary of Maxus Energy Corporation (PAS-00091776-77).

3. Operational History/COC Use and Presence at the Facility

According to the *1985 80 Lister Avenue Site Evaluation*, industrial development on the site is reported to date from the 1870s. Drawings from 1914, revised in 1922, show the site to be part of the former Lister Agricultural Chemical Company (Lister) property that

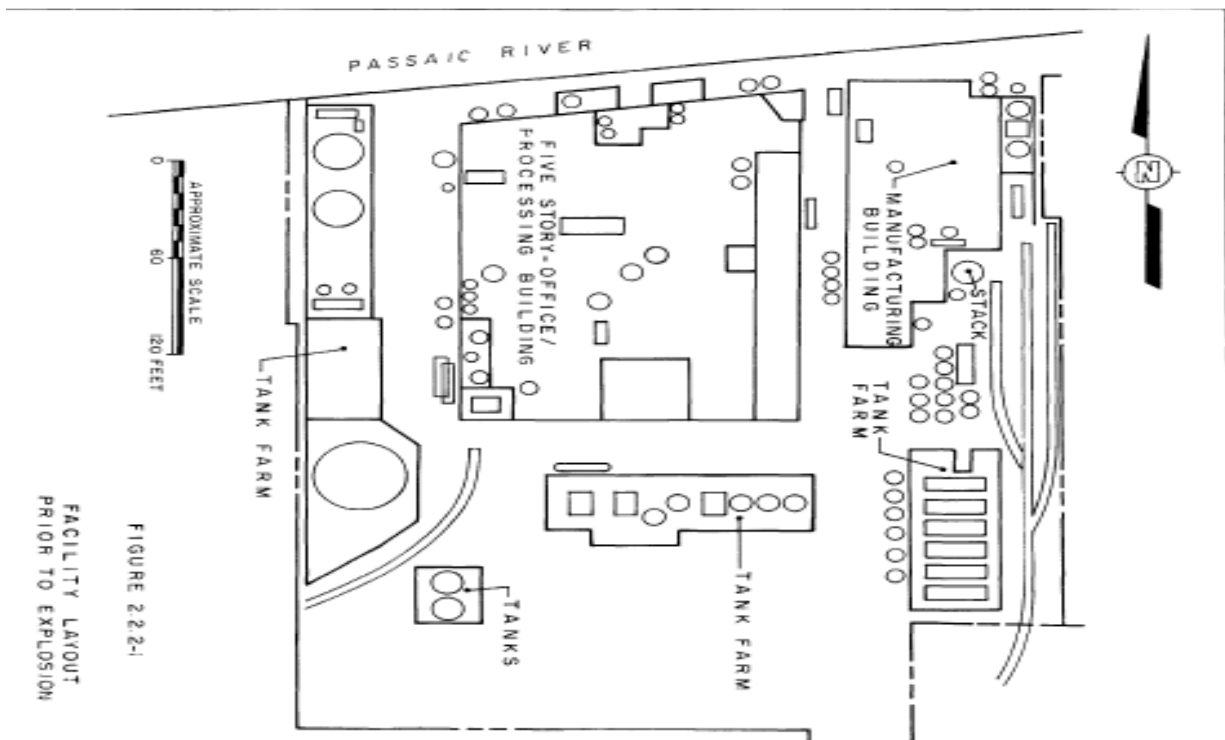
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extended for some distance along the Passaic River. The report states that "During the period of ownership by Lister, the site reached its present dimensions following filling along the south shore of the Passaic River to form the northernmost 30 percent of the property. Much of the remainder of the site is also filled with the granular material reportedly used to fill the marshland that existed in the natural state. Several buildings were on the site, including the Lister power plant, which was later the chemical manufacturing building. The report also notes that when Lister ceased operations, the property was subdivided along the present property boundaries and sold. The 1.81-acre parcel was acquired by Kolker, which, by the mid-1940's, was operating an agricultural chemicals plant on the site (PAS-00126895-96).

According to the deposition of James Burke, an electrician that worked at the 80 Lister facility starting in January 1946, there were two buildings on-site during Kolker's operations--a 3-story brick building used to manufacture DDT (referred to in other documents as a 5-story building) and a 1-story brick building used to produce 2,4-dichlorophenoxy acetic acid (2,4-D) and 2,4,5-trichlorophenoxy acetic acid (2,4,5-T). He stated that these buildings had a common wall but maps from pre-1960 show two separate buildings as shown in the map below (PAP-00168275; PAP-00168285-88; PAS-00128471-72).



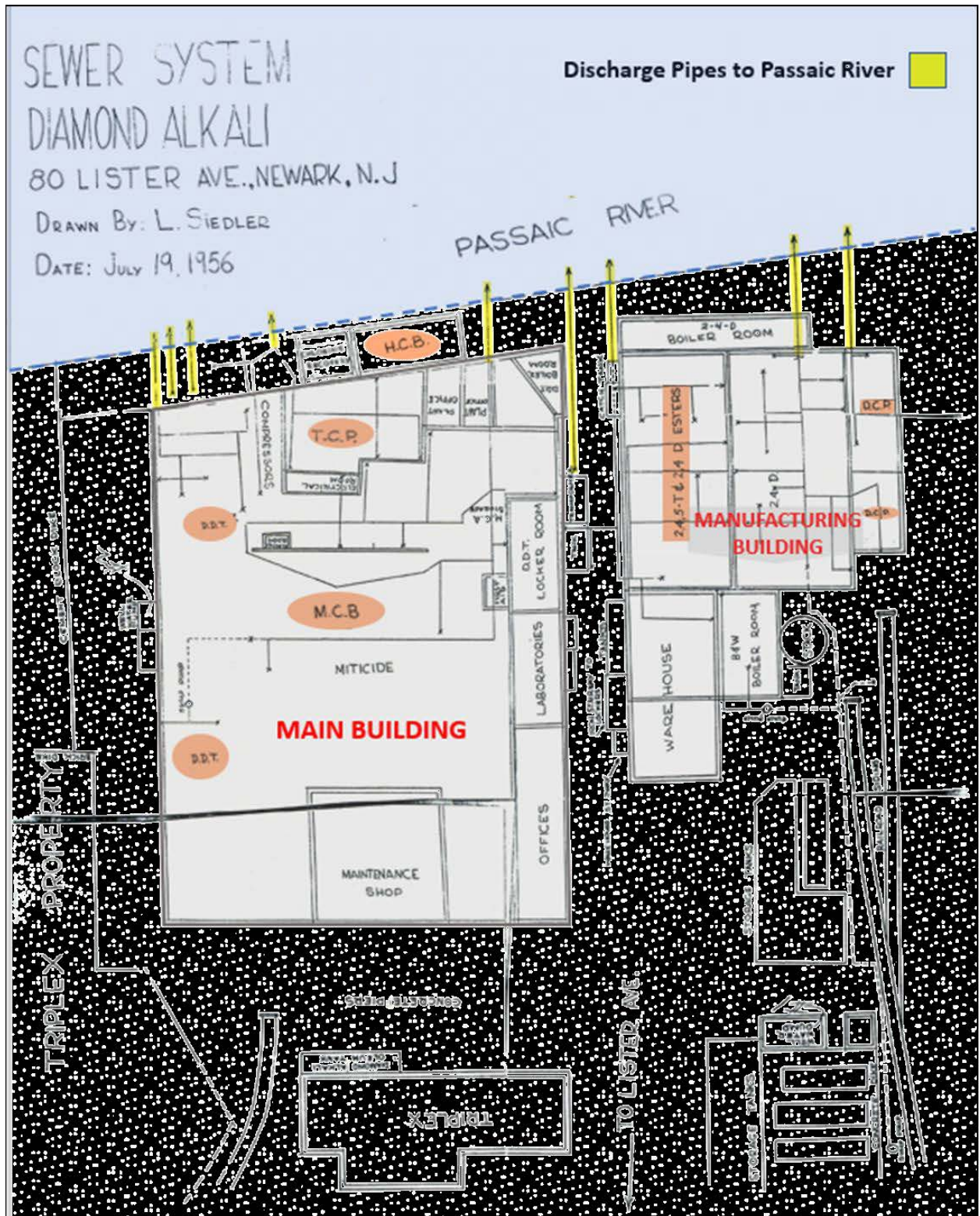
Pre-1960 Site Layout
(PAS-00126918).

A 1956 map of the "Diamond Alkali 80 Lister Ave Sewer System," shows 9 sewer lines to the Passaic River. A copy of the map from the Parette expert report is presented below with the sewer line highlighted in yellow.

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For at least a portion of time, the site and adjacent property were traversed by a system of 16- to 24-inch sewers and drains leading to the Passaic River (PAS-00126895-96). See the map below showing abandoned sewer lines in 1984.



Abandoned Sewer Lines in 1984
(PAS-00126917)

According to an October 23, 2015, *Expert Report by Cynthia Moomaw*, PE, of Geomega, Inc., prepared for Archer and Greiner, PC (legal counsel for OCC) (the Moomaw Report), Diamond occupied the facility from March 1951 to March 1971. Manufacturing ceased August 1969. Chemicaland operated at the site from March 1971 to February 1977, pursuant to toll manufacturing agreements¹ with Diamond from September 1973 to September 1974, and Occidental Chemical Corporation (OCC) from September 1975 to February 1977 (PAP-00143159-60).

Kolker and Diamond Production History

According to a 1983 *Report Prepared by Review of Documents Received from Diamond Shamrock Company* by Marilyn Fingerhut and David Marlow at the National Institute for Occupational Safety and Health (Fingerhut and Marlow Report), Kolker operated the 80 Lister facility from "February 1946 until Diamond Shamrock acquired it by an exchange

¹ In a toll manufacturing arrangement, a company provides its raw materials or semi-finished goods to a third-party service provider. The service provider, who often has specialized equipment or infrastructure, provides a subset of manufacturing processes on behalf of the company using those materials or goods for a fee (Practical Law Company, Toll Manufacturing Transactions: Trade Secret and IP Protection, Bruce Goldner and Jonathan Hillel, Skadden, Arps, Slate, Meagher & Flom LLP, with Intellectual Property & Technology, 2013).

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of stock in August 1951" (PAP-00159313; PAP-00159316). The *1985 80 Lister Avenue Site Evaluation* states that ownership by Kolker ceased in March 1951 when Kolker was acquired by Diamond Alkali Company (later Diamond Shamrock Chemicals Company) (PAS-00126867; PAS-00126897). As stated above, the Kolker and Diamond Escrow Agreement states that Diamond acquired all of the issued and outstanding shares of the capital stock of Kolker in August 1951 (PAP-00402324).

Kolker produced both dichlorodiphenyltrichloroethane (DDT) and phenoxy herbicides. Manufacture started with readily available raw materials and the principal intermediates were made on the site (PAS-00126896). The raw materials and finished products reported to have been handled during the time that Kolker and Diamond operated the plant are as follows (PAS-00126908):

Raw Material and Finished Products During Kolker and Diamond Ownership	
Raw Materials	Finished Products
Acetic acid	2,4,5-trichlorophenoxy acetic acid (2,4,5-T)
Acetic anhydride	2,4,5-trichlorophenol
Acetaldehyde*	2,4,6-trichlorophenol
Benzene*	2,4-dichlorophenol
Monochlorobenzene*	Monochloroacetic acid (MCA)
Tetrachlorobenzene	Hexachlorobenzene (HCB)*
Chlorosulfonic acid*	Dichlorodiphenyltrichloroethane (DDT)*
Methanol	p-chlorophenyl-p-chlorobenzene sulfonate (ovex)*
Oleum (20%)*	1,1,1-trichloroacetaldehyde*
Phenol	Benzensulfonyl chloride*
Sulfuric acid	p-chlorobenzenesulfonyl chloride*
Dimethylamine (DMA) (40%)	p-chlorobenzenesulfonamide*
Triethylamine	4,4' -dichlorodiphenylsulfone*
Chlorine	p-acetylaminobenzene sulfonyl chloride*
2-Ethylhexanol	p-methoxybenzene sulfonyl chloride*
Butyl alcohol	1,2,4,5-tetrachlorobenzene*
Isopropyl alcohol	Amine salts of 2,4-D (dimethyl and triethyl amines)
Butoxyethoxypropanol	Amine salts of 2,4,5-T (dimethyl and triethyl amines)
Nicotine*	Esters of 2,4-D (butyl, 2-ethylhexyl, isopropyl, butoxyethoxypropyl)
Sodium Hydroxide	Esters of 2,4,5-T (butyl, 2-ethylhexyl, isopropyl, butoxyethoxypropyl)
	Amine salts of Noley-1,3-propylenediamine
	Nicotine sulfates*
	Muriatic Acid
	2,5-dichlorophenyl-p-chlorobenzene sulfonate*

* = raw materials and products not used or made after an explosion in February 1960

Other chemicals produced and/or utilized at the site include pentachlorophenol, Velsicol AR-50G, kerosene, and heavy aromatic naphtha (PAP-00399355; PAP-00142894; PAP-00402810).

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Diamond's 1983 History and Operations Overview of Lister Avenue Facility states that all of the manufacturing took place on the 1.8-acre parcel. Additionally, in April 1960, 1.6 acres of property were leased from Triplex Oil and Refining Company (subsequently Walter Kay Holding Company and eventually William Leckie) and this property accommodated storage facilities and warehouses. Other property associated with the plant was a parking lot leased in 1963 from Sergeant Chemical Company (PAS-00128468; PAS-00128470).

In March 1971, the 1.6-acre site was sold and the associated lease was assigned to Chemicaland Corporation. Principals of Chemicaland were George W. Mitchell and Raymond A. Guidi, a former plant manager of the facility. The plant was involved in the production of benzoic acid, with 2,4-D being manufactured for Diamond Shamrock for a limited time. In 1980, the 1.8 acre site was purchased in a tax sale by Mr. William Leckie (Ray Holding Company) and was subsequently sold to Marisol Company in early 1981 (PAS-00128470).

According to the *1985 80 Lister Avenue Site Evaluation*, "The production units were cleaned out as they were shut down, and between September and December 1969 the remaining raw materials and products were sold and shipped" (PAS-00126899). However, as described in Section 7, equipment left on site was found to be contaminated with dioxins (PAP-00164662).

Volume

According to the *1985 80 Lister Avenue Site Evaluation* "[t]he principal products made on site by Kolker were DDT and the phenoxy herbicides with estimated total output of 100 and 110 million pounds, respectively. Production of other products is not believed to have significantly exceeded 10 million pounds." (PAS-00126896). A 1985 internal Diamond memo regarding production volume from the Lister Plant states that "DDT was the most important product of the plant prior to the transfer of its manufacture to Texas in 1958–59. Annual production reached 8–10 MM lbs. at one time and total output was near 100 MM lbs." (PAP-00402822-23). As noted above, Diamond began operating the plant in 1951 (PAP-00143159; PAS-00126897).

Estimated output of the major products reportedly produced by Kolker and Diamond is presented in the following table from the *1985 80 Lister Avenue Site Evaluation* (PAS-00126909). While the *1985 80 Lister Avenue Site Evaluation* states that these production numbers are for Kolker, it is believed these amounts include Kolker and Diamond operations combined, as indicated in the following tables.

Chemical Produced By Kolker and Diamond	
<u>Product</u>	<u>Estimated Total Production</u>
2,4-D	85 million pounds
2,4,5-T	25 million pounds
DDT	100 million pounds
HCB	10 million pounds
OVEX	10 million pounds
Lindane	Unknown
Low γ-BHC	<10 million pounds

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Note that, while Lindane and BHC are listed in the *1985 80 Lister Avenue Site Evaluation*, the deposition testimony from Stanley B. Honour, a Kolker/Diamond employee from December 1951 to February 1979, states that the Lindane process “was not used at Newark,” but rather “was used at the plant at Greens Bayou” (PAP-00403321; PAP-00403316-17; PAP-00403400).

When operated by Kolker and Diamond, the production capacity of TCP and 2,4,5-T acid was as follows (PAS-00128479):

Date	TCP (MM lb/yr-approximate)	2,4,5-T Acid (MM lb/yr-approximate)
January 1951	0.5	0.65
February-March 1953	1.5	2.0
February 1961	1.9	2.5
November 1967	2.3	3.0

Lister site production data for the major phenoxy herbicides is as follows:

YEAR	2,4,5-T (lb/yr)	2,4-D (lb/yr)
1951	NA	NA
1952	342,132	NA
1953	305,868	NA
1954	244,704	NA
1955	526,488	NA
1956	508,032	NA
1957	747,612	NA
1958	762,492	NA
1959	912,840	NA
1960	564,972	5,200,000
1961	1,206,222	4,400,000
1962	1,301,754	5,400,000
1963	1,472,813	5,000,000
1964	1,343,877	6,200,000
1965	685,427	6,300,000
1966	678,674	7,900,000
1967	1,456,692	6,300,000
1968	2,864,487	10,000,000
1969	84,207*	571,126*
1970	0	--
1971	0	0
1972	0	0
1973	0	NA
1974	0	Limited quantities
1975	0	4,077,500 toll period (year) 300,000 (April-June total) 409,500 (October 1-December 5 total)

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NA=data not available; Lb/yr = pounds per year unless otherwise noted; * = Average monthly value (pounds per month from 11/68 to 1/69) (PAP-00143186; PAP-00394457; PAP-00400518; PAP-00142922).

According to Maxus Energy Corporation's original complaint against the United States in *Maxus Energy Corporation v. United States*, Case Number 3:92CV1655-X (Maxus Complaint), commencing in 1961 and continuing through 1968, Diamond produced and delivered to the United States over 820,000 gallons of Agent Orange pursuant to contracts with the Defense General Supply Center, the Defense Fuel Supply Center, the U.S. Army, or the U.S. Air Force (PAS-00058776).

According to correspondence from an attorney representing the United States Army in the litigation brought against it by Maxus, the United States entered into contracts with Diamond for the production of Agent Pink, Purple and Orange as follows:²

DATE	CONTRACT NO.	PRODUCT
11/21/1961	DA30-070-CML-1635 (also identified as NY-2-612)	Agent Pink
02/12/1963	NY-3-1237	Agent Purple
05/22/1963	NY-3-1695	Agent Purple and Pink
03/1964	08-635-64-194	Agent Orange
06/22/1964	DSA-6-6790	Agent Purple
08/18/1966	DSA-400-67-C-1297	Agent Orange
10/18/1966	DSA-400-67-C-2893	Agent Orange
05/08/1967	DSA-400-67-C-8642	Agent Orange
02/29/1968	DSA-400-68-C-4708	Agent Orange
05/09/1968	DSA-400-68-C-5898	Agent Orange

(PAS-00075269-71).

The correspondence also noted that between November and December 1966, the Department of Commerce advised Diamond that the United States would require all T-acid to be produced at Newark. In connection with the United States' consideration of whether to build its own facility for the production of Agent Orange, representatives of Edgewood Arsenal visited Newark in December 1966. The United States, simultaneous with its directive requiring Diamond to accelerate delivery of Agent Orange, acted to increase Diamond's Agent Orange production capacity. In February 1967, the Department of Commerce authorized Diamond to apply a DO-D4 priority rating to obtain equipment and material needed for the Newark Plant expansion. On September 8, 1968, the Department of Commerce's Business and Defense Services Administration (BDSA) notified Diamond that it was no longer required to deliver Agent Orange at a monthly rate of 55,000 gallons as previously required (PAS-00075269, 71).

² According to a *Plaintiff's [Maxus Energy Corporation] Proposed Findings of Fact and Conclusions of Law (Annotated)* Civil Action No. 3:92CV1655-X, the term "Agent Orange" means the phenoxy herbicide formulations "Agent Orange" (approximately 50% the n-butyl ester of 2,4-D and 50% the n-butyl ester of 2,4,5-T), "Agent Pink" (approximately 60% the n-butyl ester of 2,4,5-T and 40% the iso-butyl ester of 2,4,5-T), and "Agent Purple" (approximately 50% the n-butyl ester of 2,4-D, 30% the nbutyl ester of 2,4,5-T, and 20% the iso-octyl ester of 2,4,5-T) (PAP-00182624).

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A 1983 letter from Diamond to EPA, states that 702,185 gallons of Agent Orange were manufactured from October 1966 to October 1968; and 9,775 gallons of Agent Orange were manufactured in April 1964. It presents the following data regarding sales of product in pounds from 1960 to 1967:

Sales of Product in Pounds (Technical Equivalent)							
	July- June 1960- 1961	July- June 1961- 1962	July- June 1962- 1963	July- June 1963- 1964	July- June 1964- 1965	July- June 1965- 1966	July- June 1966- 1967
T-Acid	156,908	250,342	430,355	484,705	145,854	302,569	---
Isopropyl T	22,049	45,253	38,529	84,769	141,803	8,708	31,856
Butyl-T	34,447	403,947	484,640	258,712	241,171	71,923	1,139,271
EH-T	580,343	885,688	996,687	738,791	510,523	459,344	431,788

(PAS-00075501).

An April 1960 Diamond memorandum states that the Lister facility was producing approximately 2,000 tons of 2,4-D per year with a yield slightly less than 60%. According to the memorandum, they were discarding approximately 400 tons of 2,4-D per year with at least three quarters in the form of 2,6-dichlorophenol, 2,4-dichlorophenol, and 2,4,6-trichlorophenol, consisting of about 110 tons of chlorophenols. The memorandum also estimated that they lost 50 tons of 2,4-D acid, 2,4-D sodium salt and 2,4-D esters. The 2,4,5-T effluent was noted to be generally similar to 2,4-D, but only approximately one quarter the amount. The effluent consisted mostly of trichlorophenols with some 2,4,5-T acid and 2,4,5-T esters (PAP-00155169-70). At the *Aetna* trial (PAP-00145100), John Burton testified to corrected discharge calculations of 852 tons of 2,4-D acid equivalent, 471 tons of chlorophenols, and 213 tons of 2,4-D acid, 2,4-D sodium salt and 2,4-D esters (PAP-00145135-38).

DDT Production (1946-1958)

Kolker and Diamond produced DDT in the five-story, approximately 50 year-old main building located adjacent to the Passaic River³ (PAP-00167643-4; PAS-00128471). DDT was produced from February 1946 until August 1958. A table in the 1983 Fingerhut and Marlow report states Kolker had yearly production capacity of 100 MM pounds (PAP-00142913). This is contradicted by a 1985 Diamond memo that states "annual production reached 8-10 MM lbs. at one time and total output was near 100 MM lbs." (PAP-00402823). The 1985 80 Lister Avenue Site Evaluation also reports a total output of 100 MM lbs. (as opposed to an annual output of 100 MM lbs.) (PAS-00126896), and that DDT production was then subsequently moved from Newark to Texas in late 1958 or early 1959 (PAS-00126897).

³ According to Diamond's 1983 History and Operations Overview of Lister Avenue Facility, during the 1951-1960 period "[m]anufacture of starting and intermediate chemicals was" also conducted in the main building (PAS-00128471-72).

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As described in Section 5 below, DDT was directly discharged to the Passaic River in multiple ways including:

- As a result of the discharges of spent oleum (used in the manufacture of DDT) to the LPR. (1) Some amount of the liquid DDT/chlorobenzene mixture in the reactor was directly discharged to the Lower Passaic River with the spent oleum as operators relied upon a color change in a sight glass (red oleum to hazy to white) to determine when to close the valve. (2) Some amount of DDx would also be dissolved in the spent oleum which was directly discharged to the Lower Passaic River (PAP-00399543-57; PAP-00399561-2; PAP-00143633-9; PAP-00158345).
- Direct release through sewers (i.e., floor trenches in manufacturing buildings) from floor washing and DDT material spills (PAP-00167786-88; PAP-00155385-86; PAP-00155405; PAP-00155436; PAP-00160985; PAP-00394773-74).
- Dumping of good and bad batches of DDT in the river (PAP-00160328-29; PAP-00145264-65). Nicholas Centanni, who worked for Kolker and Diamond at the Lister Plant from 1948 to 1969, testified that “[s]ometimes . . . an operator . . . instead of letting just the acid go to the river, something would distract them or he’d put the valve in the wrong position and he would send DDT, acid and everything to the river.” (PAP-00145264).

These DDT discharges from the site resulted in the formation of a large pile of DDT wastes in the LPR (PAP-00145264-65; PAP-00155439). Employees were sent into the river in boats and with rope harnesses to chop the DDT pile down below the water line (PAP-00143643-47; PAP-00159660; PAP-00160322-23).

2, 4-D and 2,4,5-T Production (1949-1969)

Kolker and Diamond produced 2,4-D and its derivatives in a second building. Production of 2,4-D was carried out in batches by the alkaline condensation of the 2,4-DCP and monochloroacetic acid (MCA) in the presence of caustic soda. The resulting sodium 2,4-D slurry was filtered and washed to remove unwanted sodium 2,6-D which was discarded. The sodium 2,4-D was then continuously acidified with sulfuric acid, washed to remove sodium sulfate, and dried in an evaporator. The resulting anhydrous, molten 2,4-D was stored for later flaking or for use in the preparation of the various 2,4-D esters or Dacamines (a proprietary line of oil-soluble amines) (PAS-00126903).

A November 22, 1949 Kolker memo with the subject “Preparation of 2,4,5-Trichlorophenol” describes “work done to date on the preparation of 2,4,5-Trichlorophenol as a basis for plant production.” The temperatures used in the laboratory ranged from 160 to 180 °C (PAP-00167168-72).

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A 1951 Diamond document indicated that Kolker had sales of 2,4,5-T esters amounting to \$278,997 for the fiscal year which ended January 31, 1950. A May 1950 article states that Kolker was producing 2,4,5-T at the site (PAP-00400305). One of the raw materials, tetrachlorobenzene (TCB or T4CB) was also produced on site because it could not be purchased at that time (PAP-00167644-47; PAP-00167658).

After acquiring Kolker in 1951 until July 1969, Diamond manufactured the phenoxy herbicides 2,4-D and 2,4,5-T, at the 80 Lister facility (PAS-00058771). Production of 2,4,5-T was carried out by an analogous process to that used for the manufacture of the 2,4-D. All components of the process for manufacture of 2,4,5-T were operated in the same manner as those for 2,4-T, although at slightly different temperatures and pressures (PAS-00126903).

In a 1987 deposition, John Burton, a plant manager at the Lister facility for both Kolker and Diamond, stated that, from approximately 1951 to 1953, Diamond used the same equipment to produce both 2,4-D and 2,4,5-T (PAP-00167686-87). The Moomaw Report states that "Diamond's use of the same process equipment to manufacture 2,4,5-T and 2,4-D would have likely introduced dioxin into this 2,4-D equipment and any 2,4-D equipment used in the process downstream of this equipment." In addition, Diamond produced 2,4-D and 2,4,5-T esters and amines in the same reactor. The Dacamine reactor, which was used to produce both 2,4-D and 2,4,5-T Dacamines by Diamond was later used by Chemicaland in their 2,4-D production (PAP-00143149; PAP-00143160).

TCP

TCP production was started in 1950 in the main building. A 500-gallon autoclave was purchased for the production of TCP. One of the raw materials, tetrachlorobenzene (TCB) was also produced on site, as it could not be purchased at that time (PAP-00167643-47; PAP-00167658; PAP-00167666). Laboratory work pertaining to the production process of TCP was also conducted on the first floor of the main building beginning in 1949 (PAP-00167645).

According to the Maxus Complaint, Diamond prepared the TCP, the intermediate used to produce 2,4,5-T, in a heated autoclave using the starting ingredient TCB. During that step, 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)⁴ was formed in trace amounts as a result of side reactions that occurred in the autoclave (PAS-00058771). A second autoclave with a volume of 1,000 gallons was added in 1953 (PAP-00167666).

TCP was produced at the site from 1,2,4,5-tetrachlorobenzene (T4CB), sodium hydroxide (NaOH), and methanol in the autoclave. NaOH and methanol would combine to form sodium methoxide, which reacted with T4CB to form the intermediate product 2,4,5-trichloroanisole (TCA). TCA would then react with another molecule of sodium methoxide to form TCP. In the autoclave and TCP storage tanks, the TCP would

⁴ Note that "dioxins" are referred to in this report using the various terms consistent with that presented in the document cited. These terms include dioxin; tetrachlorodibenzo-p-dioxin (TCDD); 2,3,7,8-TCDD; polychlorinated dibenzo-p-dioxins (PCDD); and polychlorinated dibenzofurans (PCDF). Also note that 2,4-D (2,4-dichlorophenoxy acetic acid), 2,4,5-T (2,4,5-trichlorophenoxy acetic acid), and 2,4,6-TCP (2,4,6-trichlorophenol) are products that can result in the generation of dioxins as discussed in this report.

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actually be present as its sodium salt (Na-TCP) which was soluble in water. TCP produced at the site was combined with NaOH and monochloroacetic acid to produce the herbicide 2,4,5-T. 2,3,7,8-TCDD contained in the TCP was carried through to the 2,4,5-T process (PAS-00126901-02; PAP-00210489-90). Esters and amine salts of 2,4,5-T were also made (PAS-00126903).

As reported by Diamond in its 1985 80 Lister Avenue Site Evaluation, NaTCP was made in a batch reaction by the alkaline hydrolysis with caustic soda of T4CB in the presence of methanol at temperatures and pressures near 165 °C and 350 psig, respectively. Methanol was distilled from the reaction mass and recycled (PAS-00126901-2). However, plant operating instructions called for use from 180 °C to 186 °C, and this temperature range was maintained from June 1954 to September 1954 (PAP-00159096). Temperatures in Diamond's autoclave ranged from 164 °C to 180 °C in 1966 to 1969 (PAP-00143163). John Burton states that the autoclave was run at temperatures from 160 °C to 172 °C (PAP-00167737).

According to *Parette, et al. (2018)*, from 1949 until 1954, a "dilution-filtration" process was employed at the site to purify TCP for approximately five years until September 1954 (PAP-00210172). In this process, "2,4,5-TCP (coming from the autoclave following methanol removal) was diluted with water to a concentration of 5-10%. As 2,4,5-TCP was present as its sodium salt (Na-TCP), it was soluble in this added water. However, the unreacted organics, the raw material 1,2,4,5-tetrachlorobenzene (TCB) and the intermediate product 2,4,5-trichloroanisole (2,4,5-TCA), were dense and relatively insoluble. In the dilution-filtration process, the unreacted organics were allowed to settle out for a period of one hour, forming a sludge in the bottom of the dilution tank. . . . 2,3,7,8-TCDD is also a dense, relatively insoluble organic with a high octanol/water partition coefficient . . . , suggesting that it would have preferentially partitioned to, or concentrated in this organic sludge phase. The operating instructions for the dilution-filtration process indicated that the settled waste organic sludge was discharged to the LPR . . . (PAP-00210172; PAP-00168381-5; PAP- 00149641-51; PAP-00159145-49; PAP-00155450-52.)

According to Diamond's *1983 History and Operations Overview of Lister Avenue Facility*, "all processing equipment for the manufacture of sodium NaTCP and other primary chemicals were located within the main building. Little information is available as to the exact location of the NaTCP equipment within the building . . ." Wastes produced in this process included a filter cake which contained water insoluble materials, such as T4CB, 2,4,5-trichloroanisole (TCA), and would likely trap any dioxin present in the reaction product. This process was replaced in 1954 with a steam distillation to remove TCB and TCA. Any dioxin present, because of its volatility, would also be removed either partially or totally. The distillate (organics) from this process step were stored for recycling in the future, subject to development of a process for their use. The first recycle of recovered organics from the steam distillation was made in December 1956 and was then made a routine operation (PAS-00128471-72).

Diamond's *1983 History and Operations Overview of Lister Avenue Facility* also states that liquid wastes from the process consisted of aqueous solutions of sodium chloride and sodium sulfate. Prior to October 1954, the aqueous solutions of sodium chloride

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and sodium sulfate were separate. After this date, the process was modified such that the sodium chloride and sodium sulfate were discharged as a single solution from the 2,4,5-T acid process. Condensate (aqueous layer) from the steam distillation was the other liquid waste from the process. Muriatic acid was also produced as a by-product in the main process building from the hydrogen chloride produced in the chlorination of acetic acid/anhydride to monochloroacetic acid (MCA) and the chlorination of phenol to 2,4-dichlorophenol. This acid was produced in processes not related to the production of TCP and was generally sold to re-claimers (PAS-00128472).

An April 4, 1960 memo from John Burton, states that “[a]ll of our unsold muriatic acid is dumped in the Passaic. . . . In 1958 we dumped 2000 tons; in 1959 we dumped 4400 tons.” (PAP-00155170.)

Beginning in October 1954 (one month after the switch from dilution-filtration to steam stripping to purify the Na-TCP), the plant discontinued the practice of acidifying the Na-TCP to remove the NaCl, and the NaCl was carried through to the Na-TCP storage tank and ultimately to the 2,4,5-T process (PAP-00159095-6).

During the late 1950's several process changes were instituted to improve the operating efficiency of the plant. Among these was a change instituted around 1956 to the TCP process to recycle TCA. A change in the handling of process effluent also occurred in 1956 with the installation of an industrial sewer connecting to the PVSC Lister Avenue line (PAS-00126897). See below for additional disposal information.

In 1967, “the basic process for preparation of NaTCP was not changed but provision was made for the removal of sodium chloride by filtration from the stream-stripped solution of NaTCP and the removal of dioxin 2,3,7,8-TCDD by adsorption on activated carbon The sodium chloride recovered in the filter was dissolved in water for disposal by the industrial sewer. The activated carbon in the adsorption column was treated with muriatic acid and hot water washes to remove iron hydroxide. These treatment solutions were then disposed of in the industrial sewer. Spent carbon was removed from the unit and handled by a disposal firm. The basic processes for manufacturing the 2,4,5-T acid, esters or amine salts were not changed.” (PAS-00128473.)

The resulting NaTCP solution was then steam distilled to remove by-product TCA that also was recycled to the reactor. Following steam distillation, the NaTCP solution was diluted with water, and then passed through a carbon bed to remove dioxin. The purified but dilute NaTCP solution was then reconcentrated for use in the 2,4,5-T process by acidifying two-thirds of the stream, then separating the TCP from the water to raise the TCP content to 93 percent. This concentrated TCP was neutralized with caustic soda to reform the NaTCP and then mixed with the remaining third of the diluted NaTCP, yielding NaTCP of the correct concentration for use in the manufacture of 2,4,5-T (PAS-00126901-902).

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Phenoxy Acids, Esters, Amine Salts and Formulations

The phenoxy acids, esters, amine salts and formulations were prepared in the separate smaller building located to the east of the main manufacturing building (PAS-00128471-72).

Esters of 2,4-D and 2,4,5-T

The production of 2,4,5-T esters involved the following steps:

- production of sodium trichlorophenol (NaTCP)
- reaction with sodium monochloroacetate to yield a sodium salt of trichlorophenoxyacetic acid
- trichlorophenoxyacetic acid was reacted with sulfuric acid to yield the 2,4,5-T with a suitable alcohol at the proper reaction conditions to give the corresponding ester or with a suitable amine to give the corresponding amine salt (PAS-00128470).

According to the *1985 80 Lister Avenue Site Evaluation*, the esters of both 2,4-D and 2,4,5-T were formed by batch reaction with the appropriate alcohol in the presence of sulfuric acid which acted as a catalyst. The alcohol and by-product water were distilled throughout the reaction and the alcohol was held for later reuse in the process. On completion of the reaction, the last traces of water were removed under vacuum, and the ester was then transferred to storage to await sale (PAS-00126903).

Amines of 2,4-D and 2,4,5-T

The *1985 80 Lister Avenue Site Evaluation* states that the water-soluble dimethylamine (DMA) salts of 2,4-D or 2,4,5-T were formed by the reaction of a water solution of DMA with either wet or dry 2,4-D or 2,4,5-T. The resulting amine salt solutions were adjusted for concentration and then stored for later sale. A proprietary line of oil-soluble amines (the Dacamines) was prepared by the reaction of N-oleyl-1,3 propylenediamine with either dry, molten D or T acids or the flaked acids (PAS-00126903).

2,4-DCP

According to the *1985 80 Lister Avenue Site Evaluation*, the direct chlorination of phenol in the presence of a ferric chloride catalyst was used to make 2,4-DCP. The reaction was carried out in batches at atmospheric pressure. Detailed chromatographic studies of the process to optimize the 2,4 content were correlated with the freezing point of the reaction mass, and the results were used as the routine means of process control. The 2,4-DCP was stored and handled as produced in the molten state (PAS-00126902).

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MCA

The *1985 80 Lister Avenue Site Evaluation* states that MCA was made by the chlorination of a mixture of acetic acid and acetic anhydride in batches. Routine process control was again effected by measuring the freezing point of the product. MCA, similar to the 2,4-DCP, was stored and used in the molten state without dilution or purification (PAS-00126902).

MCB/T3CB/T4CB/DCB

Monochlorobenzene (MCB) was used as a solvent and as an intermediate in the manufacture of DDT and other organic products (PAP-00398133). MCB was also produced at the site. In the production of MCB, dichlorobenzene (DCB) was produced, corresponding to ~10% of MCB. The DCB byproduct was utilized as a raw material in the manufacture of T4CB during the Kolker period of plant ownership. 1,2,4-trichlorobenzene (T3CB) was utilized as a raw material in the manufacture of 2,5-dichlorophenol, and 1,2,4-T3CB was also an impurity in the 1,2,4,5-T4CB that was utilized as the raw material in the production of TCP. A mixture of 1,2,4-T3CB and 1,2,3-T3CB was used at the site as a raw material in the production of HCB (PAP-00403438; PAP-00403533; PAP-00403534; PAP-00400425).

HCl

According to the *1985 80 Lister Avenue Site Evaluation*, HCl, produced as a by-product of the 2,4-DCP and MCA processes, was absorbed in water to form 32-percent muriatic acid, which was sold in the local area (PAS-00126901-903). This conflicts with the 1960 memo from Diamond plant manager Burton, which said "All of our unsold muriatic acid is dumped in the Passaic. . . . In 1958 we dumped 2000 tons; in 1959 we dumped 4400 tons." (PAP-00155170).

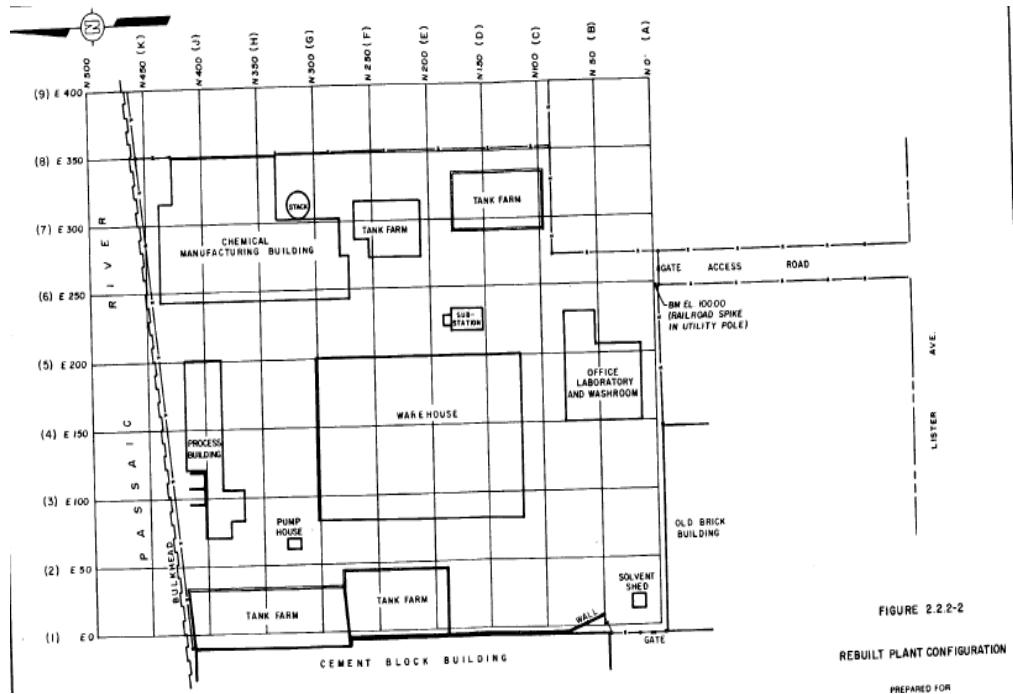
1960 Explosion

The *1985 80 Lister Avenue Site Evaluation* states that during the period of operation of Diamond the manufacture of several products was either transferred to other locations or discontinued, leaving the phenoxy herbicides as the only products of the plant. A major impetus for this change was an explosion in February 1960 which destroyed several plant processes. When rebuilt the plant only included processes for the manufacture of the phenoxy herbicides and their intermediates. The layout of the plant site after it was rebuilt is shown below. Modernization and expansions continued during the 1960's, which saw total phenoxy capacity more than double to 15 million pounds per year (PAS-00126897).

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(PAS-00126919).

The February 1960 explosion occurred in the TCP unit and destroyed the large five-story building in which it and several other plant processes had been located. Following the explosion, a decision was made to limit future production of phenoxy herbicides, ending output of HCB, ovex and the benzene sulfonyl chloride derivatives (PAS-00126897-98).

According the 1985 80 Lister Avenue Site Evaluation, since a larger site was required for rebuilding the plant, the adjacent 1.6-acre parcel was leased. This property, which had been used for reclaiming oil, contained several buildings and large tanks which were razed to permit installation of a new laboratory and office building, a maintenance shop/warehouse building, and a tank farm for flammable raw materials along the west side of the property (PAS-00126898).

Following demolition of the remains of the damaged building, a new process building devoted to the manufacture of sodium trichlorophenol (NaTCP), 2,4-dichlorophenol (2,4-DCP), MCA, and by-product hydrochloric acid (HCl) was erected along the river near what had been the north end of the old building. Following this construction, the manufacture of the intermediates was carried out in the new buildings, leaving the old undamaged chemical manufacturing building for the production of 2,4-D; 2,4,5-T and their esters and amines (PAS-00126898).

Diamond's 1983 History and Operations Overview of Lister Avenue Facility states: "Two additional buildings separate from the process building were also provided. The largest of these housed the maintenance shop, production and shipping offices, and an area for materials storage. The smaller building housed the general plant offices, the quality control laboratory, and the dressing room. . . . Other improvements related to bulk

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materials storage were also made at this time. The new process building was designed to have all drainage trenches discharge through a sump into the industrial sewer. The plant was expanded in 1967 by the addition of a new 2,4-D acid unit and conversion of the old 2,4-D acid unit to 2,4,5-T acid manufacture. The warehouse was expanded and an extension added to the Process Building to house the NaTCP purification process" (PAS-00128472).

The *1985 80 Lister Avenue Site Evaluation* described changes in the process and manufacturing buildings from 1963-1967 as follows:

The process building remained largely unchanged—the only addition was equipment installed in 1967 to purify the NaTCP by removing dioxin. The period 1963 to 1967 saw several major projects in the 2,4-D and 2,4,5-T manufacturing areas including:

1963: The 2,4-D acid process was rehabilitated. The roof was raised permitting installation of new ventilating ducts to carry process fumes to a new and larger caustic scrubber.

1965: The melt, washing, and drying process for the production of dry, flaked 2,4-D was installed, with a 40 percent increase in capacity. These changes also reduced personnel contact with the 2,4-D.

1967: The final plant expansion saw the construction of a new and larger 2,4-D unit and the conversion of the former 2,4-D unit to the manufacture of 2,4,5-T. The TCP purification process for dioxin removal via carbon filtration was added as part of this same expansion. Capacity increased by 54 percent for 2,4-D and 67 percent for 2,4,5-T (PAS-00126898-99; PAS-00126910-11).

In August 1969, Diamond discontinued operation at the plant. The plant was listed for sale and remained idle throughout 1970 until it was purchased by Chemicaland Corporation in March 1971. Chemicaland purchased the 1.8 acres and improvements owned by Diamond, which then assigned rights to the 1.6 acres it had leased from Walter Ray Holding Company to Chemicaland (PAS-00126899).

According to the *Moomaw Report*, after unsuccessfully operating on their own, Chemicaland entered into a tolling agreement with Diamond from September 1973 to September 1974 to produce 2,4-D. The plant required repairs to bring it online, including replacement of missing equipment (e.g., flaker), repairs to piping in the dichlorophenol (DCP) and MCA areas, and replacement of tankage that was in poor condition (e.g., TCP storage tank may have been used to replace the sulfuric acid storage tank). Several pieces of equipment previously used to manufacture 2,4,5-T were repurposed by Chemicaland and used in the 2,4-D process. This repurposing of equipment and the potential cross-contamination of dioxin from the 2,4,5-T to the 2,4-D process was recognized by Diamond personnel who commented that "*We should be sure to assay the 2,4-D that is produced for any levels of Dioxin that might show up from use of the 'T' equipment . . .*" (PAP-00143161- italics in original).

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The *Moomaw Report* states that Chemicaland entered into a second tolling agreement with OCC to produce 2,4-D from September 1975 to February 1977, when manufacturing at the Lister Site ceased. The property remained idle through 1980 and eventually was sold to Marisol Inc. in March 1981. Marisol filled 570 drums with solid and liquid waste left in equipment when the plant was shut down in February 1977 (PAP-00143161).

Dioxin Producing Processes

The following table shows the chemicals for which the manufacturing process resulted in the production of dioxin (PAP-00208962):

Dioxin in Chemicals Manufactured at the 80 Lister Avenue Site	
Chemicals	Component/Byproducts
Agent Orange	2,4,5-T
2,4,5-T	NaTCP
NaTCP	TCA and TCB

According to *Parette, et. al. (2018)*, the 2,4,5-T “dilution-filtration” purification process used for approximately five years until September 1954 was a significant source of 2,3,7,8-TCDD to the Passaic River. This purification process generated a dioxin-rich sludge that was discharged to the river (PAP-00210169). Operating instructions for the 2,4,5-TCP process at the site for 1951 through 1954 indicated that 2,4,5-TCP (coming from the autoclave reactor following methanol removal) was diluted with water to a concentration of 5-10%. As 2,4,5-TCP was present as its sodium salt (Na-TCP), it was soluble in this added water. According to the article, the raw material 1,2,4,5-tetrachlorobenzene (TCB) and the intermediate product 2,4,5-trichloroanisole (2,4,5-TCA), are dense and relatively insoluble. In the dilution-filtration process, the unreacted organics were allowed to settle out for a period of one hour, forming a sludge in the bottom of the dilution tank. 2,3,7,8-TCDD is also a dense, relatively insoluble organic, suggesting that it would have preferentially partitioned to, or concentrated in this organic sludge phase. The operating instructions for the dilution-filtration process indicated that the settled waste organic sludge was discharged to the river. In the process, settled unreacted organics sludge was left in the dilution tanks. When sufficient sludge had accumulated to overflow, any remaining 2,4,5-TCP was extracted from this organic sludge by adding water and raising the pH. Following extraction of the 2,4,5-TCP, the unreacted organic sludge was discarded to the “sewer”. In this context, “sewer” referred to a series of drain pipes leading from the buildings at the site to the river. In September of 1954, the dilution-filtration process was replaced by a steam stripping purification process to remove 2,4,5-TCA from the crude 2,4,5-TCP (PAP-00210172; PAP-00168381-5; PAP-00149641-51; PAP-00159145-49; PAP-00155445-52).

A report by Neil M. Ram, an expert retained by Repsol, S.A. in 2015 (Ram Report), states that 2,3,7,8-TCDD was present in both the NaTCP and 2,4,5-T that Diamond produced. In 1965, analysis of an unspecified number of samples of dilute TCP solution and 2,4,5-T (acid) yielded 2,3,7,8-TCDD concentrations up to 40 ppm. Samples of TCA (a recovered byproduct of NaTCP manufacturing) also exhibited measureable levels of

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2,3,7,8-TCDD. Tests on an unspecified number of samples of undiluted (100%) TCP assayed later in 1965 yielded 2,3,7,8-TCDD concentrations ranging from 80 ppm to 140 ppm, while 2,4,5-T samples assayed later in 1965 yielded 2,3,7,8-TCDD concentrations ranging from 7 ppm to 26 ppm (PAP-00208934; PAP-00208962-63).

The *Ram Report* further states that in September 1967, Diamond Shamrock began treating all NaTCP produced, using an activated carbon adsorption column to remove 2,3,7,8-TCDD. As a result, 2,3,7,8-TCDD concentrations in the NaTCP and 2,4,5-T that Diamond produced from September 1967 to August 1969 (when plant operations were suspended) were reduced from those experienced prior to treatment. Six samples of NaTCP assayed in 1968 and 1969 (one per quarter) exhibited 2,3,7,8-TCDD concentrations ranging from 0.2 ppm to 9.0 ppm (PAP-00208962-63).

According to the *Ram Report*, although literature indicates that dioxin is not present in T4CB, dioxin was detected in samples collected from the former T4CB storage tank and from the T4CB rail car unloading line (PAP-00208962). The *Ram Report* states that documents indicate the presence of 2,3,7,8-TCDD in the TCB that Diamond used to manufacture NaTCP. Hooker Chemical Company (Hooker) supplied the T4CB and shipped it to the 80 Lister Avenue site via railcars, where it was subsequently unloaded into a T4CB storage tank at the facility via a dedicated unloading line. In or around 1991, 2,3,7,8-TCDD was detected at a concentration of 4,200 ppb, in a sample of residue collected from the T4CB storage tank (PAP-00208961-63; PAP-00208935).

The *Ram Report* also states that a second sample of the T4CB tank residue, collected in 1992, contained 13,000 ppb of 2,3,7,8-TCDD; another sample collected in 1992 from the T4CB unloading line contained 6.7 ppb of 2,3,7,8-TCDD. The lower 2,3,7,8-TCDD concentration in the unloading line (6.7 ppb) compared to that those in the storage tank (4,200 ppb and 13,000 ppb) was attributed to the absence of visible residue in the line (the sample "consisted primarily of pipe rust") (PAP-00208961-63; PAP-00208935).

Dioxin in TCP and 2,4,5-T

A July 25, 1988 *Statement of Factual Premises* submitted on behalf of Diamond Shamrock Chemicals Company in *Diamond Shamrock Chemicals Company v. Aetna Casualty & Surety Co.*, Docket No. C-3939-84 ("DSCC's *Statement of Factual Premises*"), states that all of the 2,4,5-T manufactured at the 80 Lister Avenue plant from approximately January 1951, when production began, through mid-1969, when production ended, contained dioxin (PAP-00149735-36).

Dioxin formation has been identified to occur in the production of TCP by the caustic hydrolysis of TCB. At the Diamond plant, this reaction was carried out in the autoclave reactor, a closed high-pressure vessel operated at a high temperature. The autoclave was located inside the process building before the 1960 explosion in the TCP unit, and outside of the new building after the explosion on the north side in concrete bunkers along the river (PAP-00143163).

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According to a Diamond Interoffice memorandum, a survey of 31 autoclave batches from 12/28/53 to 6/7/54 indicated a plant practice of operating about 170°C with some batches as low as 160 c. Operating instructions called for 180-186 c. so this temperature range was maintained from 6/54 to 9/54 (PAP-00159096). Temperatures in Diamond's autoclave ranged from 164 to 180°C in 1966 to 1969 (PAP-00143163). John Burton states that the autoclave was run at temperatures from 160 to 172 degrees (PAP-00167737).

According to an internal Diamond memorandum dated September 18, 1957, a representative from C.H. Boehringer Sohn visited the Lister Plant in September 1957 and identified 2,3,7,8-TCDD as the likely chloracnegen and higher autoclave temperatures as the cause of dioxin generation in TCP production (PAP-00155172).

According to the *Moomaw Report*, Diamond started to look for ways to reduce dioxin in TCP and 2,4,5-T starting in approximately 1965. Dilution and filtration of the TCP solution was tested from 1965 to 1967 with some success, but better results were obtained using activated carbon, which was pilot tested starting in September 1967. A permanent carbon column was installed in July of 1968. Testing that took place during the dilution and filtration period showed dioxin concentrations in TCP ranging from 6,500 to 140,000 ppb in the unfiltered samples, and from <1,000 to 90,000 ppb in the filtered samples. The majority of the data during this period ranged from ~5,000 to 60,000 ppb. During testing with the pilot and permanent carbon column, dioxin concentrations in unfiltered samples ranged from <1,000 to 19,000 ppb, and dioxin concentrations in the carbon filtered samples ranged from 200 to 9,600 ppb. Less data were collected for the final product 2,4,5-T, but the dioxin concentrations were generally within the same range for the filtered and unknown filtration categories. Dioxin concentrations in Diamond's Agent Orange, a ~50/50 mixture of 2,4,5-T and 2,4-D ranged from 50 to 17,000 ppb (PAP-00142931; PAP-00143163-64).

According to the *Moomaw Report*, dioxin was detected in samples taken in the process downstream of the autoclave, with 73,000 ppb detected in recovered TCA in 1965 and 75,000 ppb detected in waste from a sump north of the process building where TCP was produced in 1968 (PAP-00143164).

Agent Orange

According to the DSCC's *Statement of Factual Premises*, Agents Orange, Purple and Pink each contained the ester 2,4,5-T, which in turn contained the contaminant, dioxin (PAP-00149723). The statement notes that during manufacturing operations at the 80 Lister Avenue plant small quantities of dioxin were created as an unintended impurity in the manufacture of TCP, an intermediate chemical used to manufacture 2,4,5-T acid and other products (esters and amines) derived from 2,4,5-T acid. This resulted in dioxin being present as an impurity in all the 2,4,5-T acid and its derivatives which Diamond manufactured and sold and at the plant site and its immediate environment. Agent Orange and other Agents consisted of either mixtures of 2,4,5-T esters or mixtures of 2,4,5-T esters and an ester of another product, 2,4-D (PAP-00149735).

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Dioxin and 2,4-D

According to the *Moomaw Report*, the EPA has identified the manufacture of 2,4-DCP and 2,4-D as having a possibility of being associated with halogenated dibenzo-p-dioxins (PCDD) because of the reaction of an orthohalogenated phenol at high temperature ($\geq 145^{\circ}\text{C}$) and alkaline conditions. However, the direct chlorination process used by Diamond and Chemicaland to produce DCP was carried out at a low temperature and low pressure. Temperatures in Diamond's DCP reactor and 2,4-D reactor ranged from 73 to 110°C and 99 to 109°C, respectively, from 1966 to 1969. These temperatures were lower than the temperature postulated by the EPA and, therefore, not conducive to dioxin formation. Dioxin was not expected to be associated with and was not tested for in DCP or 2,4-D during Diamond's "p-dioxin" testing in 1960 (PAP-00143165).

The *Moomaw Report* states that in a review of literature, dioxin was not found in samples of 2,4-D, 2,4-DCP, or 2,6-DCP from the 1960s or 1970s with detection limits ranging from 10 to 1,000 ppb. By the 1990s, with improved method detection limits, dioxin was detected in a subset of 2,4-D samples of unknown origin at a maximum of 0.13 ppb, and was not detected in 2,4-DCP at a detection limit of 0.1 ppb (PAP-00143165). As noted above, however, the use of the same equipment for 2,4,5-T and 2,4-D resulted in dioxin in the 2,4-D.

Other COCs

An August 2004 *Pre-assessment Screen and Determination for the Diamond Alkali Superfund Site* issued by the NJDEP and the Natural Resource Trustees, concludes that PAHs, PCBs and metals present on the Diamond Alkali property are also a legacy of manufacturing operations. The report notes that the total PCB maximum concentration was 47.7 ppm in a Passaic River core slightly downstream of the Lister facility. It did not discuss PCB contamination at the Lister facility (PAP-00210437; PAP-00210452).

An analysis of a soil sample from the site, appearing in a 1987 paper published in the scientific literature, found pentachlorophenol (PCP) in a site soil sample at a concentration five to six times greater than measured for either TCP or 2,4-dichlorophenol (DCP) (PAP-00399864-9). OCDF and OCDD were measured in this same site soil sample at concentrations greater than that measured for 2,3,7,8-TCDD (PAP-00399864-9).

Dieldrin

It is possible that dieldrin was present at the facility as a plant drawing dated February 14, 1959, shows four vessels labeled "Black Leaf 40" (a nicotine-based insecticide) (PAP-00402810). In March 1955, Diamond formed Diamond Black Leaf Corp. with Virginia-Carolina Chemical Corp. (PAP-00397571). The Diamond Black Leaf formulating plants were located in Richmond, Va., Louisville, KY, Montgomery, AL, and Waco, TX. (PAP-00397571). Black Leaf advertisement shows a pesticide with 5% dieldrin; however, there is also a Black Leaf 40 product next to this product that does not state that it includes dieldrin (PAP-00400429).

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PCBs

According to a ChemRisk 1990 Progress Report, MCB, DCB, T3CB, T4CB, HCB, and chlorinated pesticides are “rated as having high or very high potential for PCB contamination” (PAP-00184827). MCB, DCB, T4CB, and HCB were manufactured at the site via the chlorination of benzene (or lesser chlorinated benzenes), and MCB, DCB, 1,2,4-T3CB, 1,2,3-T3CB, and T4CB were utilized at the site as raw materials in various chemical processes (PAP-00399570-72; PAP-00399606-07; PAP-00402886; PAP-00403437-39). A Diamond Process Memorandum shows that Diamond knew that PCBs were a “possible byproduct” in the manufacture of HCB (PAP-00403454). PCBs were detected in soils, sumps and tanks on site. In 2015, contaminated soil samples from the site were collected and analyzed for contaminants including PCB congeners. In two of the five soil samples from this study (designated as DWC-3-0608 and DWC-3-0406), PCB-209 was the dominant PCB congener, with its concentration estimated at 58 percent and 49 percent of the total PCBs respectively in these samples. In these same two samples, PCB-12/13 was the PCB congener with the second greatest concentration (PAP-00398173-88.)

Therefore, PCBs were generated at the site as byproducts during chemical production. As discussed below, the autoclave sump overflowed to the Passaic River and the main building where HCB was manufactured and sumps were never connected to the industrial sewer.

In addition, Monsanto sales records show the purchase of 5,000 pounds of 16 1050 200 transformer inerteen PPO by Diamond Alkali in 1967 (PAP-00207137). Inerteen coolant contained PCBs.

PAHs

Kolker is listed as a producer of naphthaleneacetic acid in a 1948 article in *Chemical Industries* (PAP-00401714; PAP-00401717). According to a 1950 article in the Journal of the American Chemical Society, the direct condensation of naphthalene with MCA was a synthesis pathway that was used to produce α -naphthaleneacetic acid (PAP-00400430). As described above, MCA was produced at the Diamond facility as it was a raw material in the manufacture of 2,4-D and 2,4,5-T. The production of α -naphthaleneacetic acid occurred during the pre-1956 time period when the site was not connected to the industrial sewer and all effluents were discharged to the Passaic River.

A Diamond Chlorinated Products Division – Newark January 1, 1962 Standard Cost document, lists Velsicol AR-50G as a raw material for a brush killer formulation (PAP-00399447). According to a 1947 advertisement, Velsicol AR-50G, contained methylnaphthalenes and provided co-toxicant properties for DDT and other insecticide solutions (PAP-00401702). A 1959 plant drawing of the facility showed a tank designated “Solvent AR50G” next to a “DDT solution” tank (PAP-00402810).

According to a 1968 Diamond Interoffice Memorandum regarding Dacamine History, with new laboratory facilities in 1961, a Dacamine formula was developed containing 880 Solvent. This solvent was blended at the Newark facility and was a blend of kerosene

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and heavy aromatic naphtha (HAN). In 1965, the 880 solvent was replaced by an all-aromatic HAN (PAP-00396638-39). The use of kerosene and 880 solvent is documented earlier also as a kerosene storage tank and an 880 solvent storage tank appeared in the 1959 plant drawing (PAP-00402810). Kerosene contains a number of PAHs.

120 Lister

According to a May 1985 *Site Evaluation*, 120 Lister Avenue, the 2.2-acre property located at 120 Lister Avenue is a former chemical storage and shipping facility. An investigation by the NJDEP and EPA in the spring of 1983 established that portions of the property were contaminated with 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), as was the adjoining property at 80 Lister Avenue (PAS-00125770; PAS-00125781).

During the period of ownership by Diamond of the adjoining 80 Lister Avenue property, Sergeant Chemical Company owned the 120 Lister Avenue property. The site was comprised of several major structures, including a brick building, a block building, and a tile building. The site was used by Sergeant to store, repackage, and distribute a variety of small-lot-quantity organic and inorganic chemicals (PAS-00125787-88). In November 1963, Diamond leased the parking lot from Sergeant. The lease was terminated when Diamond ceased production operations on the 80 Lister Avenue site in 1969 (PAS-00125787-88).

Recalcitrant Activities

In 1984, Diamond sued a number of its insurers in New Jersey Superior Court seeking coverage for environmental costs and property damage and personal injury claims (hereinafter referred to as the “*Aetna* litigation” or “*Aetna* trial”) (PAS-00128423-24). Judge Stanton found that Diamond, as a matter of corporate policy, intentionally and continuously discharged dioxin, DDT, and other hazardous substances from the Lister Plant into the Passaic River during the entire period of its plant operations (PAS-00128449). Specifically, the trial court found that:

- “From 1951 to 1956, Diamond intentionally discharged all of its waste chemical effluent into the Passaic River.” (PAS-00128425).
- In 1956, the Passaic Valley Sewerage District insisted that DSCC discontinue their discharges into the Passaic River and, in response, DSCC “purportedly tied its entire complex at the (Lister Plant) into an industrial sewer constructed by the Passaic Valley Sewerage Commission.” (PAS-00128426).
- However, “(a)lthough Diamond purported to tie the whole (Lister Plant) into the sewer in 1956, it actually tied only the 2,4-D building into the sewer. The chemical effluent from the main building continued to be discharged directly into the Passaic River.” (PAS-00128426).
- Those discharges “were intentional, planned discharges from processing equipment through pipes or ditches.” (PAS-00128426).

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- “In addition, from 1951 through 1969, spills onto floors and ground surfaces drained mostly into the Passaic River. These spills were constant, and, collectively, they were substantial in volume.” (PAS- 00128426).
- “Diamond was conscious that its discharges into the (Passaic) (R)iver were illegal. It deliberately concealed them, and over a period of many years employed an alarm system to warn employees to stop the discharges when Passaic Valley inspectors were on the premises.” (PAS- 00128426).
- “Over the years, discharges from the (Lister Plant) into the Passaic River included 2,4,5-T acid (and dioxin), caustic soda, DDT, sulfuric acid, TCP (and dioxin), muriatic acid and monochlorobenzene.” (PAS- 00128426).
- “Housekeeping at the (Lister Plant) ranged from inadequate to poor throughout the entire period of its operation by (DSCC). . . . Spills of liquid and solid chemical products and wastes were literally continuous during every day of the plant’s operations. Some pipes were always leaking.” (PAS-00128427).

Walter Klosowski, who worked as a chemical operator at the Lister facility from July 1947 until 1953, stated in a deposition that “they would only clean up when they had an inspection” and that Mr. Kolker would notify the employees when there was going to be an inspection. According to Mr. Klosowski, “you faked everything” for an inspection and basically stopped working while the inspector was there so they did not see any materials get on the floor (PAP-00143640-42).

Mr. Burton noted in his 1987 deposition that “we didn’t want to be caught violating the regulations” (PAP-00393948). In his 1988 deposition he explained that when an inspector checked in the receptionist would sound “I think it was three buzzes” on the inter-plant communication system which would alert the foreman and the operators that an inspector was at the plant. They would then take steps to see that anything going into the river at that moment was stopped (PAP-00159724-25). Mr. Burton also stated at the *Aetna* trial that he thought the alarm system was “a clever strategy” that he was “proud of” and it was a “joke within one echelon of the division” (PAP-00145115).

A deposition of Aldo Andreini who worked at the 80 Lister Avenue facility from 1955 to 1969 states that they were told not to “drop anything out to the river” when an inspector was there on a boat (PAP-00149596-98, 604, 607).

Arthur Scureman, a Lister Plant employee from 1951 until 1969, noted the following activities:

- He conducted early morning overtime work, which meant “put(ting) some stuff away in the river.” He testified, “(a)nd I used to come in early, work overtime to drop it in the river because they didn’t want the barges and everything going up and down see us dropping anything in the river.”

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- He further testified about the dumping of contents of barrels of waste material from the 2,4-D or 2,4,5-T Building into the Passaic River early in the morning while it was dark. Dumping occurred at night because Diamond management didn't want anybody along the river to see them dumping it. Employees were instructed to dump the unwanted product and waste slowly so that it would not later be visible in the water. He said that if a batch fouled up they would move it from the kettles that were maybe 500-1,000 gallons into drums and then get rid of it.
- Mr. Scureman also described his orders upon seeing the company's guard come in with inspectors, which was to "try and stop them so they don't go to the river front; and run in the building and the ester room and 2,4-D building and tell them to stop dropping all their stuff to the sewer, close off the valves." (PAP-00159632, 657-660, 670, 672).

In a July 10, 1956 memorandum regarding the "Newark Effluent Problem," Plant Manager Mr. Burton explained to B.D. Gleissner, an officer in Diamond's corporate office, prior to 1956 the Lister Plant had "rerouted our lines containing HCl to underneath the surface of the water so that they were never detected as a source of acid effluent." The memorandum continues:

(PVSC) particularly specified that the 2,4-D alkaline filtrate would be satisfactory to go into the sanitary sewer, although at the time at least, they did not know about its high phenolic content. In general, I feel that if we clean up some of the materials which have some noticeable content of solids that we are not appreciably contaminating the river which has a tremendous flow at this point. The proof of this is our own planned river pump installation. The high phenolic content of our effluent however might some day be a serious problem if they try to make this an area where fish would live, but on the other hand they would first have to clean up the oil scum from the river which to date they have not been able to do. Nevertheless, in view of their strict rules which these various agencies have, we will have to continue to out-wit them as we have in the past or spend a substantial amount of money for neutralizing our effluent and for construction of a larger sanitary sewer out to Lister Avenue. Every year that we can stall this off we are saving ourselves a substantial amount of money and increasing the likelihood that we may have more land at that time to give us room to install some type of neutralization system. . . . Therefore, I think our fundamental position is safe at this location, although we may have to spend some capital and operating money to keep out of trouble if we are not able to continue to outwit the various agencies concerned with the Passaic River. In view of the recent activity of the (PVSC), we are going to study our effluent problem as much as time permits . . . and determine what we might do in the event that we are subject to really strict inspection and control (PAP-00143565-67).

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A July 31, 1956 memorandum regarding the Newark Effluent Problem from Diamond's Central Engineering Department in Cleveland to John Burton states that "[e]vasive tactics are fine as long as they work, but discovery of such action by the Commission can lead to a change of attitude which could be serious" (PAP-00143600).

In addition, instead of tying the whole Lister Plant to the sanitary sewer as he told the PVSC, Plant Manager Burton informed his superiors of his plan to tie the 2,4-D process building to the sanitary sewer, but not the main building: "I think our best hope at this time is that we can keep out of serious trouble until we get our 2,4-D filtrate diverted to the local sewer and to hope that we will be able to get by with our various acidic effluents from the DDT, HCB and Miticide operations in our main building." (PAP-00396608).

In an October 16, 1957, Interoffice Correspondence from W. R. Taylor of Diamond's corporate office in Cleveland, OH to J. Burton, Mr. Taylor offered to talk to Mr. Burton prior to a meeting of the Water Pollution Committee of the Manufacturing Chemists Association about any problems or questions he wanted to bring up at the meeting. He offered to do this to reduce the possibility of "information leaking out that you and the company would rather not have outside our organization" (PAP-00143599).

A deposition of Chester Mysko, an employee at Diamond Shamrock, noted that he saw bad and good batches of product dumped into the Passaic River from the Lister plant and that this happened better than once a month. He also stated, "Anything could have been going on at night. That's when it usually went down in there anyway. They saved it until nighttime" (PAP-00161237). When asked if he noticed any difference between how much DDT was dumped into the river on different shifts he stated in trial testimony that it was done mostly at night. "If they had a bad batch it was at night. That's when there -- they clean their -- what do you call it on the boiler, the stack. They used to blow that. Everything was done at night." (PAP-00160328).

Health-Related Issues

Mr. Burton recalled that as early as 1950, Diamond's employees contracted a skin condition known as chloracne (PAP-00393911-12, PAP-00209828-29). According to the *Parette et. al. (2018)* article, not long after the dilution-filtration process was replaced by a steam stripping purification process in September of 1954, to remove 2,4,5-TCA from the crude 2,4,5-TCP, a chloracne outbreak occurred among the operators of the 2,4,5-TCP process at the facility (PAP-00210172).

At least by 1954, Diamond was aware that the chloracne was associated with the operation of the TCP production unit, specifically the autoclave (PAP-00144048). In his March 18, 1987 deposition, John Burton stated that they realized that the chloracne trouble was centered in the TCP unit. The individuals that operated the TCP unit were the first to get chloracne. He also noted that they had chloracne trouble in the 1950 to 1951 time period, which they blamed on making their own tetrachlorobenzene because of impure materials. However, the workers involved with the tetrachlorobenzene manufacturing would have also worked in the TCP unit (PAP-00167625; PAP-00167669).

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According to *Supplemental Answers from Interrogatories*, from October 3, 1952 through October 24, 1968, 60 Diamond employees filed New Jersey Department of Labor (NJDOL) incident reports with respect to various dermatological conditions including chloracne experienced while employed at 80 Lister Avenue (PAP-00144040; PAP-00144046-47).

Nicholas Centanni, who worked for Kolker and Diamond at the Lister plant from 1948 to 1969, testified that he developed chloracne “around” 1955 (PAP-00149589); according to interrogatory responses, he was one of the individuals that filed a New Jersey Dept. of Labor incident report on April 29, 1953 for “various dermatological conditions, including chloracne” (PAP-00144046). Mr. Klosowski estimated that, 90 percent of the employees at the plant were experienced these conditions (PAP-00143679-80).

The *Supplemental Answers from Interrogatories* also states that after the 1955 chloracne outbreak, Diamond “installed improved ventilation in the production facilities and renovated the floors to facilitate cleaning and to improve housekeeping. Employees were informed of the necessity to be scrupulously careful to avoid contact with material within the process stream. TCP workers were issued fresh uniforms daily and were afforded an opportunity for a daily shower at 80 Lister Avenue on company time” (PAP-00144049).

Maintaining temperatures below 155°C to minimize the formation of dioxin was recommended by a German company producing TCP (PAP-00155172). A September 18, 1957 Diamond memorandum, regarding pentachlorophenol and chloracne, states that an individual from the company Boehringer visited the plant and stated that the production of TCP produced a very toxic chemical, 2,3,7,8-TCDD, linked to chloracne if the autoclave temperatures were above 155°C (PAP-00155172). The same memo states that “[i]t is quite likely that by dropping our reaction temperature 15° or more from . . . our current level of operation of 170° C, we may suffer a significant decrease in reaction rate and prolongation of our reaction cycle time. (PAP-00155172).

A Diamond employee in 1957 also diagrammed 2,3,7,8-TCDD and identified it as the cause of chloracne (PAP-00155172). A 1959 Diamond memo recognized that Diamond understood temperature to be the primary factor in the incidence of chloracne, but the memo did not indicate any plan to lower autoclave temperatures (PAP-00159618). Diamond found that higher autoclave temperatures created faster chemical reactions in the autoclave, which in turn lowered costs. However, the higher temperature also generated more 2,3,7,8-TCDD. In former Diamond plant manager Gordon Steward’s testimony as a witness for Diamond in the *Aetna* litigation by Diamond against its insurers, he acknowledged that if Diamond had reduced the temperature in the autoclave, it would have reduced the production of dioxin, but also reduced the amount of product that was made (PAP-00144510, 523-526). Dr. T. W. Fraser Russell, Diamond’s expert in the personal injury litigation by former Diamond employees and neighbors, opined that adopting Boehringer Sohn’s suggestions “would have resulted in a far less productive and significantly less economic operation of the plant.” (PAP-00455678-80).

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A 1963 Diamond memo states that “[a]s long as [the Lister P]lant has been in operation, there has been a chronic problem in the employees hired of an acne condition which is referred to as chloracne. At one time, some 40 of these 72 workers in the plant were so affected with the chloracne.” (PAP-00143596). In March 1963, a doctor from the United States Department of Health, Education, and Welfare investigated the plant and found “breaks in the process, evidenced by contamination of equipment, ceilings, floors, stairs, and hand railings, particularly in the old building.” (PAP-00154191). The doctor recommended that every man in the plant be subject to testing due to chloracne (PAP-00210167). Harry Weiner of Diamond’s corporate office rejected this recommendation due to his concern that a “disorganized group from a government agency entering the plant . . . might well result in very wide and unfair newspaper publicity as is usually done to sensationalize.” (PAP-00143541).

According to DSCC’s *Statement of Factual Premises*, Dow identified dioxin as the chloracnegen in 1965 and provided Diamond and others in the industry with a method to measure the very small quantities of dioxin present in the “T” process stream (PAP-00149741). According to DSCC’s *Statement of Factual Premises*, thereafter Diamond attempted to devise a method to reduce or eliminate the dioxin present in its process stream. After other unsuccessful efforts, Diamond installed a carbon adsorption tower in 1967. Thereafter, the amount of dioxin present in the 2,4,5-T process stream at the 80 Lister Avenue plant was substantially reduced, although the amount that did remain was above the “action level” for dioxin that regulatory authorities eventually adopted in the 1980’s (PAP-00149741).

4. Identified COCs

- PCBs (used, released, detected)
- Dioxins and furans (used, released, detected)
- PAHs (used, detected)
- DDT (used, released, detected)
- Dieldrin (detected)
- Mercury (detected)
- Copper (detected)
- Lead (detected)

5. COC Pathways

Effluents to Passaic River

On June 28, 1949, an inspector with the PVSC found Kolker was discharging “rusty scale and soda wash water” into the Passaic through floor drains. This was noted to be due to cleaning out of condenser tubes which was done once every 6 months. The report of this inspection notes that the owner “promised that he would divert the discharge into the sanitary sewer” going forward (PAP-00394464-65). A deposition of John Burton stated that the USACE also informed Kolker that its discharges were illegal (PAP-00167643; PAP-00167779).

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An April 1960 Diamond memorandum from John Burton states that until approximately 1956 Diamond disposed of all of its plant effluents in the Passaic River. According to the memorandum, in approximately 1956, the PVSC officially objected to Diamond's pollution of the river and the company spent about \$15,000 for a sewer connection to the Newark city sewer. The memorandum further states that "[s]ince that time, we run some of our effluents to each of these outlets." (PAP-00155169).

According to Mr. Burton in his October 17, 1988 deposition, there were several pipes projecting out from the river bulkhead and he believed that most of the individual sources of effluent each had its individual pipe that was connected to it that led to the river (PAP-00159710). Walter Blair, who worked as a pipefitter and mechanic at the Lister Plant from 1953 to 1969, stated that there were a "half dozen or so" pipes leading to the river (PAP-00160987).

According to the *1985 80 Lister Avenue Site Evaluation*, an easement was obtained to construct a 10-inch sewer under the Central Railroad of New Jersey tracks in January 1956. A sewer connecting the plant to the PVSC sewer was subsequently installed. The report notes that following construction, most process wastes were diverted from the river to the PVSC treatment plant (PAS-00126867; PAS-00126910). However, as stated in the 1960 memorandum referenced above only some of the effluent was sent to the PVSC (PAP-00155169).

Mr. Burton stated in his March 18, 1987, deposition that in 1956, the sewer line was connected only to the 2,4-D building. He noted that it would have been possible for us to have pumped some waste material from the main building to the sewer connection in the 2,4-D building, but he did not recollect doing that and said it was very probably they did not do it. In other words, the effluents from the trichlorophenol, DDT and monochloroacetic areas continued to go directly to the river after 1956 (PAP-00167625; PAP-00167786-88). The Lister plants post-1956 discharges were from its ongoing production of DDT and dioxin-generating chemicals in the Main Building as follows:

Chemical	Building	Years
DDT	Main Building	1956-1957
TCP	Main Building	1956-1960
TCP	Reconstructed Main Building	1960-1969
2,4,5-T	2,4-D Building (partially connected to PVSC)	1956-1969
2,4-D	2,4-D Building (partially connected to PVSC)	1956-1969

(PAP-00167625; PAP-00167786-88).

Diamond discharged TCP and 2,4,5-T contaminated wastewaters directly into the Passaic River until its operations ceased in 1969. Based on the record presented at trial, the Appellate Division concluded: "A number of former plant employees testified concerning Diamond's waste disposal policy which essentially amounted to 'dumping everything' into the Passaic River." Former plant manager John Burton reported that as of 1959, Diamond discharged about 100 tons of 2,4,5-T effluents to the river. According to Mr. Burton, the effluent "would consist of mostly trichlorophenols..." (PAP-00155170).

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At the *Aetna* trial, Burton revised his earlier estimates and stated that 471 tons of chlorophenols would have been discharged in waste each year (PAP-00145137). An engineering firm retained by the insurance companies in the *Aetna* litigation estimated that 100 tons of 2,4,5-T containing a 1 ppm dioxin concentration would have resulted in a single-year discharge to the river of four pounds of dioxin. Diamond's 2,4,5-T streams contained 2,3,7,8-TCDD as high as 140 ppm (PAP-00143526).

The discharges included wastewater from the operation of the anisole still from September of 1954 through February 1960. The Na-TCP solution (coming from the autoclave following distillation of methanol) was steam stripped to remove the unreacted TCA. The water (condensed from steam) and TCA were condensed and separated in the anisole still. The water from the anisole still, approximately 4 pounds for every pound of TCP produced, was discarded to the Lower Passaic River (PAP-00399786; PAP-00144997; PAP-00145089–90). In 1965, recovered trichloroanisole was measured to contain 73 ppm of 2,3,7,8-TCDD (PAP-00167096).

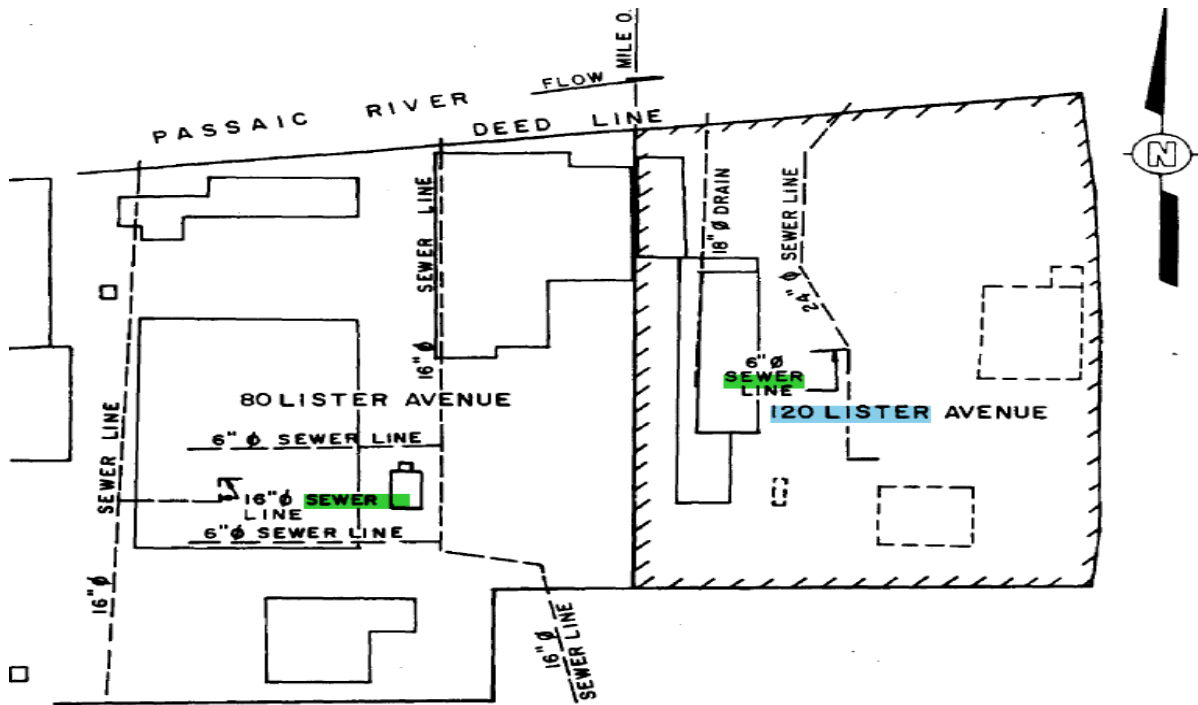
A reconstruction by *Parette et al. (2018)* of the chemical processes at the site “identified dilution-filtration, a 2,4,5-TCP purification process [that was utilized prior to September 1954], as the major pathway by which 2,3,7,8-TCDD was discharged to the [Passaic River] from the Lister Avenue site.” (PAP-00210175).

In 1960, Diamond stated that it was discharging 30,000 gallons of process wastewaters per day, one-third of which “could have contained some dioxins.” (PAS-00128474). Diamond also estimated that in 1960 the plant was generating up to 15,000 gallons per day of waste water from the 2,4-D and 2,4,5-T esters alone (PAP-00162277). Later in a confidential report on water pollution control to the Manufacturing Chemists Association in 1967, Diamond reported that it had three water-borne waste discharges to surface waters, and a fourth that discharged both to the sewer and to the river. In the report, Diamond acknowledged that it discharged to the river 8,700 pounds of dissolved inorganics and 1,780 pounds of dissolved organics each day (PAP-00154809). In 1969, Diamond completed another confidential MCA survey concerning its waste practices. In it, Diamond disclosed it was discharging 8,540 gallons per day of untreated effluent to the River (PAP-00399044).

According to the March 1986 *Passaic River Sediment Study* prepared by International Technology Corporation, in 1960, during work required to stabilize the river bank at 80 Lister Avenue, several sewer pipe discharge lines to the river were discovered. All of the uncovered conduits were plugged with concrete when the new bulkheads were constructed. Information available at the time of the report indicated that there were no conduits open to the river remaining at this installation. The figure below shows the locations of several lines at the 80 and 120 Lister Avenue sites (PAP-00151172; PAP-00151185).

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(PAP-00151199)

Mr. Centanni testified that sulfuric acid from the plant was "riverized" (sent to the river through aboveground lines). These lines could be seen at the river, particularly at low tide (PAP-00149554, 559-564). He said that all of the buildings had trenches going to the river (PAP-00149574; PAP-00145255). Mr. Burton also described trenches in the TCP and 2,4-D/2,4,5-T buildings that released to the river (PAP-00167674-77).

Arthur Scureman also testified about Diamond's discharges to the Passaic River. He described dumping the contents of drums into the River following the 1960 explosion (PAP-00145048). He described the trench system outside the building in which 2,4-T and 2,4,5-T was made, which led to the Passaic River and that before Diamond installed a catch basin, "everything used to go . . . to the river." (PAP-00159632, 657-659, 670, 721). Mr. Centanni stated that liquids in the sump were pumped out into catch basins that went to the river or they would send it out through the city line (PAP-00144132-33).

Mr. Blair testified that in the mid-1950's a pit was constructed to hold the wash waters from the D and T acid building and any overflows were rerouted so they no longer flowed into the river. When they first put the pit in they did clean it and put the wastes into drums and then they stopped doing that and started pumping to the river; when the pit filled, Diamond heated the pit contents and sent those to the Passaic River (PAP-00155385-86; PAP-00155426-28; PAP-00155411-12). Diamond was cited by the USACE on two occasions in 1965 for spillage of overflow to the Passaic River from the TCP acidification unit in mother liquor recovery (PAP-00403309; PAP-00144701-02). In 1966 the overflow from the T sodium sulfate tank was diverted from the river to the sewer (PAP-00403431).

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Former employee, Mr. Papciak, stated that there were two 10,000-gallon TCP storage tanks alongside the process building. Sometime after 1960 he cleaned the tanks when necessary. He emptied the product and filled it up about two-thirds with water, draining to the river (PAP-00394595-96).

A Diamond internal March 26, 1960, memorandum, states that the "waste disposal problem" pertained to muriatic acid, the 2,4,5-T acid process, the 2,4-D acid process, the caustic scrubber (2,000 gallons to the river daily), wash waters from 2,4-D and 2,4,5-T esters, and sulfuric acid from the scrubbing towers. The plant was noted to have a 10" clay pipe sewer line which connected to the "City Industrial sewer." This line was principally used for dumping wastes from the D and T acid units (PAP-00394422-24).

Sludge and Residue to Passaic River

February 5, 1954, Operating Instructions for 2,4,5-Trichlorophenol, state that sludge and acid waters were discarded (PAP-00155445; PAP-00155450). Following extraction of the 2,4,5-TCP, the unreacted organic sludge was discarded to the "sewer." In this context, "sewer" referred to a series of drain pipes leading from the buildings at the site to the Passaic River as, all plant effluents, including sludges, were discharged into the river prior to connecting to the PVSC in 1956 (PAP-00210172).

Mr. Centanni testified that sometimes, an "operator would follow up and instead of letting just the acid go to the river, something would distract them or he'd put the valve in the wrong position and he would send DDT, acid and everything to the river and there was a time they had a mountain of DDT and I mean a mountain of it because [it] solidifies when it hits [the] water (PAP-00145264). He also testified that [w]hen it got real cold, the Passaic River would stay at low tide and then you would see it" (PAP-00145265). Mr. Blair also testified that there was a pile of DDT in the river (PAP-00155439). Mr. Mysko testified that he "was sent in the river at low tide to chop what we used to refer to as the mountain of DDT" and his supervisor told him "[t]o get this DDT out of the river because it was too obvious for boats going by." (PAP-09160322-23).

According to Arthur Scureman, when the tide would go down, there was like an island of DDT in the river. He said they would put a rope around him and he would go down in there and watch the tide and chop the DDT with an ice chopper and put it in drums (PAP-00159626; PAP-00159660661).

In his deposition, Mr. Klosowski also described being hired by Mr. Kolker in around 1951 to go out into the river on his day off on a boat with his father to hoe down a big mound of residues in the Passaic that had come from the 2,4-D plant because the mound was sticking out of the water. They would chop it down and spread it out in the river so it was not visible. He said the same thing happened in 1954 but he was not the one who went out as the first time the paint on his boat was damaged (PAP-00143643-46).

2,3,7,8-TCDD was discharged to the Lower Passaic River with the disposal of waste salt (NaCl) from the cleaning of the Na-TCP storage tanks. The reactions to manufacture TCP resulted in the formation of approximately 800 pounds of NaCl in each batch of TCP (large autoclave), of which approximately half would precipitate (PAP-00159095-6;

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PAP-00399789-92). A 1960 Diamond memo stated that the NaCl precipitated in the Na-TCP storage tank, requiring cleaning approximately every 6 months (PAP-00399789-92). The Na-TCP solution retained in the precipitated NaCl was discharged to the River in this cleaning process (PAP-00167697-700). Plant manager Burton testified that the Na-TCP storage tank was cleaned by pumping it as empty as possible, washing the tank with water, physically shoveling the contents (primarily NaCl), and disposing the shoveled-out contents and the wash water into the river (PAP-00144997; PAP-00145091-92). The residue from the cleaning of the Na-TCP storage tank was recognized in a 1987 site report prepared for Defense Steering Committee in the *Aetna* litigation as a source of "dioxin-containing materials." (PAP-00160071; PAP-00160077).

After the 1960 explosion which destroyed the Main Building, but prior to the 1961 start-up in the new Process Building, the two 15,000 gallon "[Na-]TCP storage tanks were washed out, repaired, and relocated." (PAP-00399797). In 1965 Diamond estimated that the TCP in the Na-TCP storage tanks contained approximately 12 pounds of 2,3,7,8-TCDD (PAP-00399568-69).

According to Diamond's *1983 History and Operations Overview of Lister Avenue Facility*, process wastes included filter cake from product filtration, spent carbon from the carbon column and sludge removed from the process area waste sump. In 1967, these wastes totaled eight tons per year. In 1969, the wastes totaled three and a half tons per year. A carbon column was installed to remove dioxin from the TCP production in September 1967. The first column was a "pilot" unit and was 12" in diameter. This unit was used from September 8, 1967, until the installation of a full-scale column in July 1968 during the plant's annual shutdown. In January 1969, the carbon in the "new" column was replaced. This carbon was in use when production of 2,4,5-T was discontinued in July 1969. The carbon bed was washed with acid when the dioxin level of the TCP could not be maintained at an acceptable level, or the column plugged. The dioxin was bonded to the carbon. The spent carbon was drummed and disposed of off-site by a waste disposal contractor. This appeared to be done in January 1969. After the process was shut down, the column was reportedly included in the sale to Chemicaland Corporation (PAS-00128475).

Spills and Leaks

DSCC's *Statement of Factual Premises* notes that contamination of the Lister facility from Diamond's 2,4,5-T production process resulted from numerous small, largely unidentifiable, leaks and spills (PAP-00149742).

However, the trial Court's Opinion in the *Aetna* litigation, decided April 12, 1989, stated that there were constant spills and leaks onto the factory floors and the outdoor ground surfaces of the "Newark plant." According to the Opinion, considered one at a time and in isolation from each other, many of those spills and leaks might qualify as accidental. However, considered in their totality, as they must be in order to do justice to the realities of this situation, the spills and leaks establish a definite pattern of operation. Toleration of substantial and continuous spilling and leaking was the way of life at the "Newark plant." The Opinion also states that factory floors at the "Newark plant" were so badly corroded by acid spills that they had to be replaced nearly every summer. Trenches and

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sumps frequently backed up and overflowed onto ground surfaces. Chemical stains and deposits on ground surfaces throughout the site were clearly visible to the naked eye. Visitors to the plant had to wear overshoes and slickers to protect their clothing. Floors were replaced so that people could walk without falling and hand trucks could be wheeled where needed, but nothing was done to mitigate the polluting effect the spills and leaks had upon the physical environment (PAS-00128449-50).

According to the documents and deposition testimony, the Aetna defendants' engineering consultants estimated that the process spills and leaks resulted in 96 pounds of 2,3,7,8-TCDD in the soil at 80 Lister Avenue. The consultants did not estimate how much 2,3,7,8-TCDD the Lister facility discharged to the Passaic River (PAP-00160078).

According to the *Moomaw Report*, after the explosion in 1960, the new process building was equipped with a concrete-lined trench that ran its full length and serviced the tank farm on the east end of the building and collected floor spills and leaks from the MCA and DCP chlorinator and TCP methanol areas and process discharges (e.g., spent acid from the carbon column). The trench led to a sump that overflowed to the industrial sewer and then to PVSC. Two additional concrete-lined sumps were located outside of the process building on the north side by the autoclaves and the hydrochloric acid process. Overflows from these sumps were connected to the river and received dioxin wastes from autoclave upsets, TCP vents routed through the air scrubber, and the anisole still (PAP-00143166). As stated above, in 1968, dioxin was found at 75,000 ppb in the sump receiving anisole waste.

Information from depositions regarding spills and leaks include the following:

- **Scureman:** In the 2,4,5-T and 2,4-D Building, material was all over the floor and the pumps and centrifuges leaked (PAP-00159649-51). Every summer they would shut everything down and fix the floor and sewers. After a year the sewers used to fall apart and the acid running on the floor ate up the concrete (PAP-00145044).

Mysko: In later years when I was a mechanic, I used to drain pumps and drain piping right on the ground. I was told to do it. Drain it, fix it, hose everything down into the river (PAP-00160310). Mr. Mysko also stated that if you walked in the 2,4,5-T area you went sliding. You had to be very careful because it was all over the place, it was like an oily substance, and the water did not even wash it down. Therefore, what they used to do was wash it down with sulfuric acid. They used to soak the whole floor with sulfuric acid, let it sit for an hour or two and hose it down and everything went into the river, sulfuric acid and 2,4,5-T and everything that was on that floor (PAP-00161238). When employee Mr. Mysko was asked if his supervisor knew spills were being washed into the River, he responded, "[i]t was company procedure." (PAP-00161212-13).

- **Centanni:** Sump pits would overflow and go all over the land (PAP-00144130).
- **Blair:** When the floors at the Lister Plant were washed down, the wash water went directly into the Passaic River. He also stated that there were open trenches in the

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floor of the DDT Building and the 2,4-D Building that released to the Passaic River (PAP-00155385-86; PAP-00155436; PAP-00155405; PAP-00160985).

- **Centanni:** Sulfuric acid was used to clean the concrete floors of the 2,4-D and 2,4,5-T plants and warehouse, "cause we'd get all that gum, you know, from a spill, from a spill of chemicals." He noted the floors where the DDT was made were dirt (PAP-00149565-66; PAP-00145246). When cleaning the concrete floors they scraped the material from the floors and put the "hard stuff" in drums for disposal at the dump and whatever else was left would go into an open sewer that released to the river. When asked what chemicals were spilled he said 2,4-D and 2,4,5-T (PAP-00149568-70; PAP-00145249).
- **Andreini:** Worked in the formulations area from 1955 to 1969, which had trenches so that if there was a spill, which occurred if a drum had a leak, the discharge would go on the floor and it would be washed down into the trench and go out into the river. He noted that this occurred through 1969 when the operations ceased. He also stated that he had seen wastewater being discharged to the river from the ester unit and possibly from the 2,4-D unit and the warehouse. He did not know what was being discharged specifically. In addition, drums leaked when being filled and this material would go into the trenches to the river (PAP-00149596-98, 604, 607).
- **Papciak:** The old building was a dump (PAP-00394782). The railings had about half an inch of DDT all over. There was DDT hanging all over the place, up on the ceilings. Like somebody blew a batch and wasn't finished. In the dryer they would shoot up the vent and DDT would come up the vent, hit the ceiling and it would just stick up there. . . . All the dust would be all over the place. The walls, everything, got DDT on it. The floor was always white with DDT (PAP-00394773-74).

Autoclave Blowdown Sump Discharges

After the reconstruction of the Lister facility in 1960, the two (2) new 1,000-gallon autoclaves for TCP manufacturing were located outside the Process Building between the building and the LPR (PAP-00403468-69). A sump, referred to as the autoclave blowdown sump, was located between these autoclaves and the river (PAP-00403441). Pressure relief valves from the autoclaves (where 2,3,7,8-TCDD was formed) were directed to pipes which were submerged in this sump so that methanol released from the autoclaves could be adsorbed by the water for additional safety (PAP-00403469). The sump was maintained full of water by passing process cooling water through the sump before the water overflowed to the river (PAP-00403469; PAP-00144430). Sediments in this sump were analyzed in 1968 and showed 2,3,7,8-TCDD levels of 75 ppm (PAP-00167212).

Air Dispersion

According to DSCC's *Statement of Factual Premises*, the contamination of "offsite" locations by dioxin that migrated from the 80 Lister Avenue plant site appears to have been the result of windblown and personal and vehicular tracking. The major concern of

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the USEPA and the NJDEP in 1983 was "wind blown spread of dust" and tracking by persons or vehicles. In addition, during the time the plant was operating small amounts of dioxin may have escaped into the environment through vents or even through the scrubber system. Vents and scrubbers operated continuously while TCP and 2,4,5-T was being manufactured. On occasion safety discs on the TCP autoclave ruptured, releasing some of the autoclave's contents to the atmosphere in whatever stage the TCP reaction was in at the time of rupture (PAP-00149743). Numerous rupture disc releases occurred at the site (PAP-00403308; PAP-00143619-20; PAP-00159095-6; PAP-00399842-4; PAP-00159874-80).

Prior to the 1960 explosion in the main building, rupture disc releases were directed towards the river (PAP-00167812-13). Releases from the rupture disc also went onto the cement adjacent to the river and the residue was washed with hot water to the river (PAP-00143667-68). Following the plant rebuild, rupture disc releases were directed to atmosphere above the roof (PAP-00154262-63).

A former employee, Mr. Blair, recalled one incident when a disc in the autoclave ruptured and material was found on the cars in the parking lot. He testified that the plant manager at the time "told us to get them cleaned up" (PAP-00155397-98). Mr. Blair did not recall the date this happened (PAP-00155397). Mr. Homer Smith also recalled gasses being released to the atmosphere when a disc ruptured in the TCP autoclave (PAP-00159874-75). Mr. Centanni stated that material from the scrubber would settle on the cars in the parking lot and "pit the paint jobs" (PAP-00144140-41).

In his deposition, Mr. Michael Catania, former Deputy Commissioner of NJDEP, stated that dioxin had been found in an eight to ten square block area around the 80 Lister plant. He noted the source of the dioxin to be dioxin particles on soil that was blown around by the wind, mud in vehicle tires and on shoes, as well as rain washing sediments around (PAP-00394121-22).

1960 Explosion

On February 20, 1960, an explosion and fire occurred in the NaTCP autoclave reactor in the Main Building. The pressure and temperature rose rapidly in the reactor first causing a rupture disc on the reactor to blow and venting the reactor material to the Passaic River (PAP-00142884). The explosion knocked the northwest corner of the building into the river (PAP-00159643). The Aetna court concluded that "The explosion must have spread dioxin contamination throughout the plant site and onto nearby properties." (PAS-00128438). Diamond stated that there "may have been some residual materials that entered the River system during the cleanup." (PAP-00151185).

Flooding and Rain Runoff

DSCC's *Statement of Factual Premises* states that other mechanisms for migration that have been identified are tidal flooding and the movement of dioxin-bearing earth particles in rain runoff (PAP-00149743). Stormwater from the site entered the LPR via storm sewers and surface runoff (PAP-00209638; PAP-00209650).

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Some amount of 2,3,7,8-TCDD was discharged to the river through the Process Building roof drain as a result of precipitation. Following the construction of the new Process Building, the roof drain from this building discharged directly to the river. Discharges from the TCP process, specifically the vent from the anisole drop tank and the release point for rupture discs were directed to the roof (PAP-00154266). Wipe samples taken from the roof of the Process Building detected 2,3,7,8-TCDD (PAS-00127131). Partial inundation of the Lister facility from the Passaic River was reported in 1983. (PAS-00126928).

6. Regulatory History/Enforcement Actions

Violations

1949: On June 28, 1949, an inspector with the PVSC found Kolker was discharging “rusty scale and soda wash water” into the Passaic through floor drains. As stated above, John Burton, plant manager, testified that the USACE also informed Kolker that its discharges were illegal (PAP-00167643; PAP-00167779).

1956: On Monday July 2, 1956, Inspector Frank Capone and Mr. Burton, the Diamond Alkali Chemical Co. plant manager, inspected various pipes that were discharging cooling water. During the inspection, Inspector Capone noticed a colored discharge coming from a 6” broken cast iron pipe. A sample was taken of the pink colored fluid coming out of this pipe and was sent for analysis. On July 5, 1956, Inspector Capone, Mr. Andoline, and Mr. Goldberg made another inspection of the plant and told Mr. Burton about the violation after taking another sample. Mr. Burton promised to cooperate and make a change within one week (PAP-00147843; PAP-00168549).

A letter dated July 7, 1956 was received by the PVSC from the Diamond Alkali Chemical Co. signed by Mr. Burton stating that the 6-inch broken clay pipe that was discharging into the river was diverted into the Newark city sewer. On July 20, Inspector Frank Capone made an inspection at Diamond and found the 6-inch pipe again discharging into the river. A sample was taken from the 6-inch pipe and also from the pump with a one and half inch pipe connected to an open tee discharging on the concrete flooring and flowing into the river. Two other samples were taken, one from a wooden flume and the other from the rear of the south end building flowing over planking on the dock. Analysis of these samples indicated that all of the samples had a bad odor, oily content, pH 9 or more and were polluting the river (PAP-00147848).

On July 31, 1956, men were digging, laying pipes, and breaking concrete when PVSC Inspector Frank Capone visited the premises. Mr. Burton explained that he was rearranging the pipelines to clear up the situation (PAP-00147856).

On August 3, 1956 the Diamond Alkali Co. received a notice of violation (NOV). The provisions of a law of the State of New Jersey known as Title 58, Chapter 14, Sections 7 and 8 of the Revised Statutes of New Jersey (PAP-00143727). Section 7 of Title 58, Chapter 14 indicate that discharge of sewage or other

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polluting matter into certain waters was prohibited. Section 8 of Title 58, Chapter 14 indicates that discharge of sewage or certain other matter, particles, or substances into enumerated waters was prohibited (PAP-00143728).

During the daily inspection of District No. 8 from August 13 to August 17 and from August 27 to August 31, 1956 it was found that the Diamond Alkali Co., plant was discharging to the Passaic River (PAP-00147865).

As indicated in a letter dated September 4, 1956, PVSC indicated that the Diamond Alkali Co. has been cooperating in every way. They completed a piping program, which emptied their industrial waste into the sanitary sewer. Their deck area had been thoroughly cleaned and nothing but cooling and condenser water was noted as going to the river. Additional repeated inspections showed no violations (PAP-00147936). However, as noted above, Diamond only connected one of its buildings to the PVSC system.

1964: In a letter dated October 13, 1964, during a routine inspection of the waterfront facilities along the south shore of the Passaic River, the Assistant Supervisor of the New York Harbor observed a concentration of foreign matter, which contained an acid content. The letter stated that further investigation of this matter revealed that this pollution was caused by an acid discharge from inside the Diamond Alkali plant into discharge pipes located in the east and west end of the bulkhead and emptied into the Passaic River at the foot of Lister Avenue. This violation was brought to the attention of Messrs. Homer Smith, Plant Manager, and W.C. Hill, Engineer Production Supervisor at Diamond Alkali. The Diamond Alkali plant was given 30 days to investigate this discharge, after which a reinspection of the area was to be conducted to ensure compliance with Federal regulations (PAP-00143387).

1968: On August 23, 1968, the U.S. Coast Guard reported that while on a routine antipollution inspection of the facilities along the Passaic River in the vicinity of Newark, New Jersey, it tested the liquid effluent from the Diamond plant at Lister Avenue and found it to be acidic in nature. Mr. E. Bak, Production Superintendent was contacted and made cognizant of this violation (PAP-00143378).

Diamond employee A.L. Gregoric wrote an internal memo on October 18, 1968 to W.R. Taylor of the corporate office informing him of the violation. The memo stated that Diamond typically discharged about 1,000 gallons of used sulfuric acid containing organic materials twice per week (PAP-00143604-06). Shortly after, Taylor wrote an internal memo noting that Lister has "a history of repeated violations. It seems that on every Coast Guard spot check of this plant we have a bad violation" (PAP-00143601).

As found by the New Jersey trial court in the *Aetna* litigation, Diamond "intentionally and continuously discharged highly toxic chemical effluent into the Passaic River from 1951 to 1969." (PAS-00128449). According to the court, Diamond's discharges were "intentional, planned discharges from processing

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equipment through pipes or ditches.” (PAS-00128426). On appeal, the New Jersey Appellate Division agreed with the trial court’s conclusions: “We are convinced from our examination of the record that Diamond intentionally and knowingly discharged hazardous pollutants with full awareness of their inevitable migration to and devastating impact upon the environment.” (PAP-00158858).

Regulatory Actions / Administrative Consent Orders

1983: On June 2, 1983 Administrative Order No. E0-40-1 was adopted, which issued a presumptive fishing advisory in certain waters pending the analysis of fish and shellfish samples. The results of the testing indicated that fish and shellfish from the Passaic River were contaminated with dioxin in excess of the safe level thereof established by the Food and Drug Administration (PAP-00142877).

On October 10, 1983 New Jersey Governor Thomas H. Kean issued Executive Order No. 40 declaring that a state of emergency exists arising from the dioxin contamination of the premises at 80 Lister Avenue, in the City of Newark, New Jersey, and authorized New Jersey Commissioner Robert E. Hughey to make any necessary emergency measures deemed necessary to protect the health, safety and welfare of the citizens of New Jersey (PAP-00142877).

Commissioner Hughey issued Administrative Order E0-40-17, prohibiting the sale or consumption of fish and shellfish taken from the Dundee Dam in Garfield/Clifton to the mouth of that River at Newark Bay (PAP-00142877).

Diamond Shamrock Chemicals Co. v. Aetna Cas. & Sur. Co., Civ. Action No. C-3939-84 (Sup. Ct. N.J., April 12, 1989) (“Aetna”); *Diamond Shamrock Chemicals Co. v. Aetna Cas. & Sur. Co.*, 609 A. 2d 440 (N.J. Super. A.D. 1992); *cert. denied*, 634 A. 2d 528 (N.J. 1993). – The Aetna court denied Diamond’s claim for environmental cleanup costs. The Aetna court found that Diamond’s waste disposal practices for the entire time it operated the facility were intentionally violative of both good practices and the law. The court found that despite specific statutory prohibition, Diamond intentionally discharged all of its waste chemical effluent into the Passaic River, and that the “[t]he discharges were . . . intentional, planned discharges from processing equipment through pipes or ditches.” (PAP-00159460).

1984: On March 13, 1984, Diamond Shamrock entered into an administrative consent order with the NJDEP. The order required that Diamond Shamrock undertake certain actions to secure the site, prevent exposure to contaminants, and determine the vertical and horizontal extent of chemical contamination. The initial phase of the order required the preparation of a work plan, the completion of a site evaluation, and a feasibility study of remedial alternatives (PAP-00149705).

Diamond Shamrock submitted a Work Plan for the initial phase to the NJDEP on April 18, 1984. As a result of NJDEP review comments, the Work Plan was revised and an addendum was submitted on June 20, 1984. Subsequently,

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NJDEP approved the amended Work Plan and it was implemented. Mobilization of equipment and personnel to the site along with initial remedial activities commenced August 20, 1984. The actual investigation/sampling effort was conducted from September 5, 1984 through October 26, 1984 (PAP-00149705-706).

- 1994: OCC signed an Administrative Order on Consent (AOC) with the EPA to investigate a 6-mile stretch of the Passaic River centered on the Diamond Alkali plant. The primary objectives of the investigation were to determine: (1) the spatial distribution and concentration of hazardous substances, both horizontally and vertically in the sediments; (2) the primary human and ecological receptors of contaminated sediments; and (3) the transport of contaminated sediment (PAS-00033297).

Sampling results from this study, as well as other earlier sampling events taken across from and immediately downstream of the Diamond Alkali Facility portion of the Site show concentrations of 2,3,7,8-TCDD that significantly exceed the levels that can produce toxic effects to biota. Recent studies have shown that 2,3,7,8-TCDD bioaccumulates in fish, to levels rendering the fish unfit for human consumption, from sediment with a much lower level of 2,3,7,8-TCDD than found in these sediments (PAS-00033335).

These sampling results demonstrated that evaluation of a larger area was necessary because sediments contaminated with hazardous substances and other potential sources of hazardous substances are present along at least the entire 17-mile stretch of the Lower Passaic River and were further dispersed by the tidal nature of the river. As a result, in January 2001, EPA directed OCC to suspend certain work under the 1994 AOC (PAS-00033297).

- 2004: EPA and a partnership of federal and State of New Jersey agencies have undertaken a joint CERCLA-Water Resources Development Act (WRDA) study of the 17-mile tidal stretch of the Passaic River. During the course of the 17-mile study, the sediments of the lower 8 miles of the Passaic River were found to be a major source of on-going contamination to the tidal river and Newark Bay (PAS-00033334).

While the distribution of dioxin is being studied in these investigations, based on data gathered by EPA and by other entities, including OCC, the most concentrated inventory of 2,3,7,8-TCDD, appears to be in the sediments immediately adjacent to the Diamond Alkali Facility portion of the Site (PAS-00033298).

- 2008: In 2008, OCC and EPA signed an Administrative Order on Consent (AOC) to remove approximately 200,000 cubic yards of contaminated sediment in two phases from the Passaic River in the vicinity of the Lister Avenue facility (PAP-00143281, 327)). Phase I removed 40,000 cubic yards of sediment and was

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completed in 2012. Phase II removal and disposal of 160,000 cubic yards of sediment has not yet been completed (PAP-00360737, 77).

2012: In June 2012, the Cooperating Parties Group (CPG) entered an AOC to remove contaminated sediment and install a cap at River Mile 10.9 (PAP-00204764, 869-870).

2016: EPA and OCC entered into an Administrative Settlement Agreement and Order on Consent for Remedial Design on September 30, 2016. Under this agreement, OCC has agreed to conduct the engineering and design work needed to implement EPA's 2016 ROD for the lower 8.3 miles of the LPR (PAP-00456012).

7. Response Actions

Site characterization data and information is organized below by building/process equipment data, soil data, and groundwater data.

Buildings/Process Equipment Data

As discussed in the *1985 80 Lister Avenue Site Evaluation* and a September 1987 *Record of Decision* (1987 ROD) prepared by EPA, the following data were obtained as a result of an investigation that took place in 1984:

- Wipe samples were collected from coated floors, walls, fixtures, and air ducts in on-site buildings. All wipe samples were analyzed for dioxin only. Dioxin concentrations in wipe samples were as high as 41,600 nanograms per square meter (ng/m²); the highest concentration was detected in the process building. In addition, chip samples were collected from exposed concrete floors and building exterior or brick surfaces. All chip samples were analyzed for dioxin only. Dioxin concentrations in chip samples were as high as 1,280 ppb (PAP-00150852-53).
- According to the *1985 80 Lister Avenue Site Evaluation*, dioxin contamination appeared to be greatest in the process building, where all 29 samples collected yielded positive dioxin levels. The chemical manufacturing building (with 26 out of 28 samples producing positive results) also had "significant levels" of contamination. The report goes on to state that contamination in the warehouse was significantly less than that determined in the process and chemical manufacturing buildings with some "high levels" detected in the concrete slab floor and in the dust collected from flat elevated surfaces inside the building (PAS-00127250-51). Samples collected from the outside (exterior) walls and roofs of buildings contained lower 2,3,7,8-TCDD concentrations. Chip samples of the outside wall of the warehouse had 2,3,7,8-TCDD concentrations up to 16.5 ppb. A wipe sample from the roof had a 2,3,7,8-TCDD concentration of 13 ng/m² (PAP-0015641).
- According to the *Moomaw Report*, the highest concentrations were generally found near process vessels, trenches, drains, vents, and on floors near entrances leading outdoors. Concentrations of dioxin were found in all samples from the interior of the manufacturing, laboratory/office, and warehouse buildings. Contamination detected

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in wipe and chip samples “was consistent with, and was caused by, releases from Diamond’s TCP and 2,4,5-T manufacturing operations” (PAP-00164659). The highest concentration detected in a sample collected from a chemical process vessel was 60,800 ppb (PAS-00127123, 134-135).

- According to the *Moomaw Report*, solid and liquid waste that remained in process vessels after operations ceased were removed sometime during or after 1981 and placed in 570 drums that were stored on-site in the manufacturing and process buildings (PAP-00164662).
- The *Moomaw Report* states that “[d]ioxin analysis was performed on 22 selected drum samples. Drums to be tested were selected using one of two criteria – either the drum was representative of a major group of drums or it had some particular association with the manufacturing process. Of the 22 drums analyzed, 15 indicated positive results, ranging from 1.5 ppb to 12,200 ppb” (PAP-00150858; PAS-00127185).
- According to the *Moomaw Report*, the “testing confirms that Diamond left dioxin on-site in 1969 because process waste containing dioxin was found in drums that originated from equipment used to produce Diamond’s TCP (anisole receiver) and 2,4,5-T (2,4,5-T press filter). The highest concentration was found in the TCP equipment (12,220 ppb) and an ‘intermediate level’ was found in 2,4,5-T equipment (476 ppb)”. The report also notes the dioxin concentration found in drummed waste from the TCP unit was within the range found in the Diamond TCP unit in the 1960s (PAP-00164662).

In addition, four sewer and eight manufacturing and process building sump bulk samples were collected for dioxin analysis as part of the 1984 investigation. Of the 12 samples collected, all indicated positive dioxin results, with concentrations ranging from 105 ppb to 9,160 ppb (PAP-00150853; PAS-00127137). The highest concentration was detected in a process building sump sample (PAP-00151034; PAS-00127137).

It is reported that the sumps generally had higher levels of dioxin contamination than sewers, especially those near the process building, and that contamination levels decreased with increasing distance from the process area (PAS-00127251-52, 73). Solids collected from a “Pit 3” had the second highest dioxin concentration (8,750 ppb). It is reported that these solids were likely collected from one of the sumps in the process building that received waste from the TCP process (PAP-00164663). Coplanar PCBs were also detected in three sump samples collected adjacent to the Process Building, with concentrations as high as 180 ppb (maximum concentration measured for PCB-118). Coplanar PCBs were measured in a sump residue sample collected adjacent to the Manufacturing Building in 1992, with concentrations as high as 27 ppb (maximum concentration measured for PCB-77) (PAP-00210621-41).

According to the *Moomaw Report*, the highest dioxin concentration measured in 1984 (9,160 ppb) was found in the sump by the autoclaves in a cement bunker along the river where TCP was produced. The report notes that this concentration was lower than that measured in 1968 from the same area, but still within the range of concentrations found

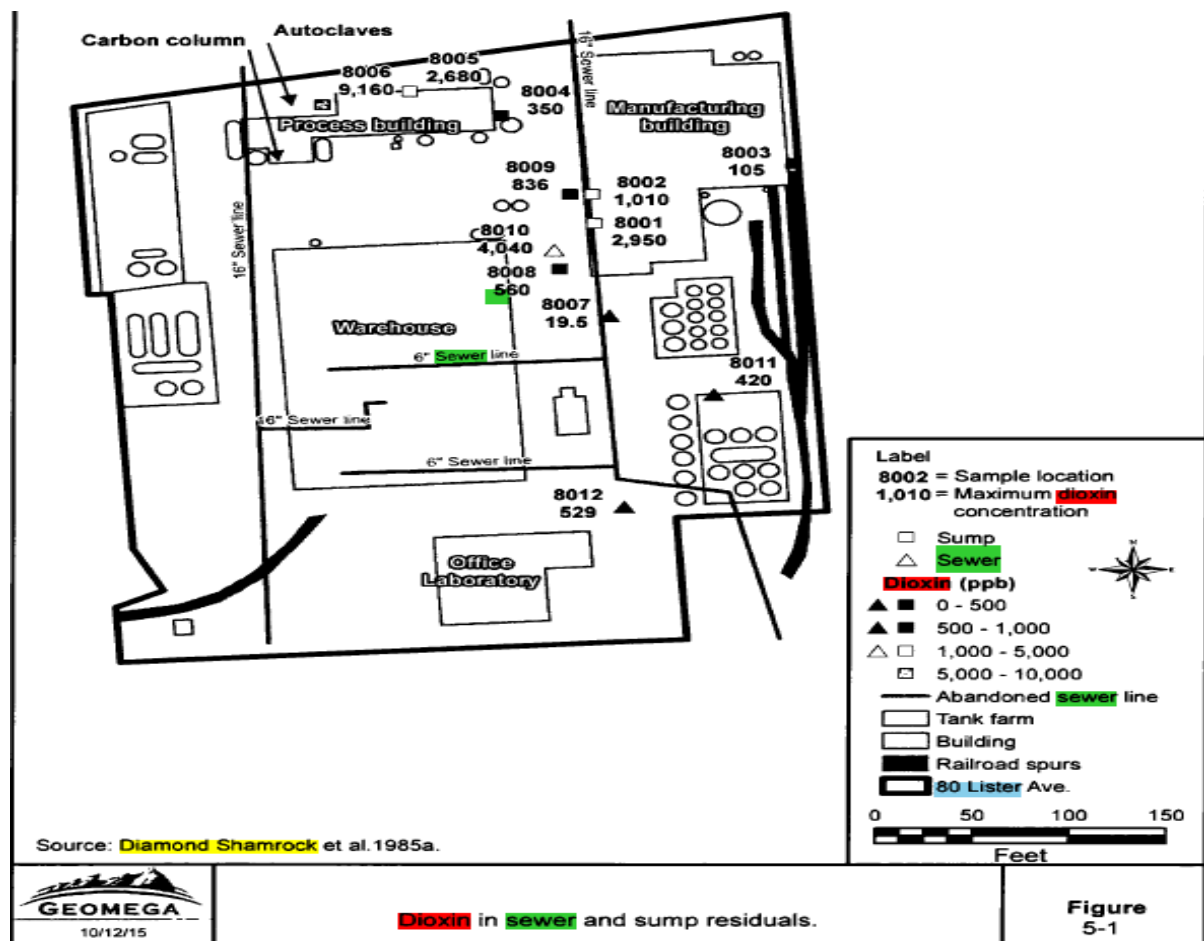
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in tests of Diamond's TCP in the late 1960s. The report goes on to note that "high" concentrations (> 1,000 ppb) were also found in the other sump along the process building and in two sumps located along the formulations area in the manufacturing building, and that all three of these sumps were in locations where materials and wastes containing dioxin from TCP, 2,4,5-T, or, their derivatives were handled or discharged during Diamond's operations (PAP-00164659). The report concludes that the dioxin contamination detected in sumps and sewers "is consistent with, and was caused by releases from Diamond's TCP and 2,4,5-T manufacturing operations" (PAP-00164659).

A figure depicting the sewer and sump data is presented below (PAP-00164687):



The 1985 80 Lister Avenue Site Evaluation concludes that due to the biased sample location strategy used to sample the buildings and process equipment, extrapolation of the results to quantify a total amount of dioxin in the 80 Lister Avenue structures was not feasible. However, an estimate of the volume of various types of materials in each of the major buildings that was potentially contaminated with dioxin was made. The total volume of material from all four major site buildings was estimated to be 3,180 cubic yards (PAS-00127251).

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As discussed in the *1985 120 Lister Avenue Site Evaluation*, prepared by Diamond Shamrock for NJDEP, and the 1987 ROD, chip and wipe samples also were collected from the 120 Lister Avenue buildings and structures to evaluate potential contamination as part of the 1984 investigation. Chip samples were collected from the interior walls, exterior walls, floor, and roof of each of the three buildings. Wipe samples were collected from the tanks, trailers, equipment, and assorted hardware and supplies. Of the 18 chip samples collected from the three buildings on the 120 Lister Avenue site, positive dioxin results were obtained for nine of these samples; however, none of the results exceeded the NJDEP "action level" of 7.0 ppb. Dioxin concentration in the nine chip samples ranged from 0.13 ppb to 6.3 ppm. Sixteen wipe samples were collected from the tanks, trailers, and equipment located at the 120 Lister Avenue site. Two of the 16 samples were positive for dioxin with concentrations of 7.9 ng/m² and 11.0 ng/m² (PAP-00150859; PAS-00125849-50).

Soil Data

According to *Priority Pollutant Analytical Results from 80 Lister Avenue Study Area, Newark, New Jersey*, prepared for EPA, dated March 30, 1984, in April 1983, NJDEP collected two soil samples from the 80 Lister Avenue property. One sample had a 2,3,7,8-TCDD concentration of 1,220 ppb. Data were not reported for the other sample. In addition, on May 27, 1983, EPA sampled soil at nine on-site locations and verified 2,3,7,8-TCDD contamination. Concentrations ranged from 60 ppb to greater than 50,000 ppb. On June 2, 1983, the NJDEP collected nine off-site soil samples. The results indicated that contamination existed off-site. Concentrations ranged from non-detected to 15 ppb (PAS-00125540).

According to *A Proposal for Integrated Engineering Investigation/Remedial Action Program for Diamond Alkali*, prepared for Diamond Shamrock Corp., dated July 20, 1983, as a result of the sampling discussed above, EPA and NJDEP requested that a stabilization fabric be placed over the site and security fencing be placed along the northern property limits adjacent to the Passaic River to control potential fugitive dust transport and erosion of TCDD soil-bound particles (PAP-00152285; PAP-00150817).

To further define the extent of contamination, Diamond Shamrock's consultant REACT collected four surface soil samples from the adjacent Sergeant's property under the supervision of the NJDEP and an additional 30 samples from the Diamond Shamrock property, including samples in the office building, warehouse, process buildings, sumps, and core borings along the northern property limits. According to the report, detected concentrations of TCDD reduced with depth; however, near the former location of the activated carbon column, concentrations remained as high as 531 ppb five feet below the surface. Preliminary estimates of contaminated materials were reported to be 14,000 cubic yards or 19,000 tons of subsurface materials contaminated with TCDD (PAP-00152285).

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According to *Priority Pollutant Analytical Results from 80 Lister Avenue Study Area, Newark, New Jersey*, prepared for EPA, dated March 30, 1984, in December 1983, 35 soil samples were collected from the neighborhood surrounding 80 Lister Avenue. Significant results are summarized below:

- 2,3,7,8-TCDD was detected at all 35 samples. Concentrations ranged from 0.07 ppb to 4.1 ppb (PAS-00125547).
- PAHs were detected in all 35 samples. Concentrations ranged from non-detect to 87 milligrams per kilogram (mg/kg) (PAS-0125548).
- Dieldrin was detected in 5 samples. Concentrations ranged from 0.02 mg/kg to 0.09 mg/kg (PAS-00125549).
- 4,4-DDT, 4,4-DDE and 4,4-DDD were detected in 23 samples. Concentrations ranged from 0.01 mg/kg to 7.7 mg/kg. (PAS-00125549).
- Copper was detected in all 35 samples. Concentrations ranged from 12 mg/kg to 1,200 mg/kg (PAS-00125550).
- Lead was detected in all 35 samples. Concentrations ranged from 71 mg/kg to 1,600 mg/kg (PAS-00125550).
- Mercury was detected in 32 samples. Concentrations ranged from 0.054 mg/kg to 1.7 mg/kg (PAS-00125551).

According to the 1985 80 Lister Avenue Site Evaluation and the 1987 ROD, as part of the investigation that took place in 1984, near-surface soil samples were collected to a depth of 60 inches (PAP-00150854; PAS-00127074). In addition, 39 samples from soil borings were collected from the silt layer (PAS-00126998; PAS-00127074). The following is summary of the maximum detected concentrations of COCs (PAS-00127141-58):

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Maximum Detected Concentrations of COCs in Soil		
80 Lister Avenue Site Evaluation - February 1985		
COC	Maximum Detected Concentration (ppb)	Depth (in inches below ground surface)
Concentrations in ppb		
2,3,7,8,-TCDD	19,500	12-24
2,4,6-Trichlorophenol	1,700,000	12-24
2,4-D	85,000	12-24
2,4,5-T	86,000	12-24
Benzo (a) pyrene	44,000	12-24
Benzo (b) fluoranthene	71,000	12-24
Chrysene	120,000	12-24
Acenaphthylene	860	12-24
Benzo (g,h,i) perylene	32,000	12-24
Fluorene	320	0-6
Phenanthrene	61,000	12-24
Indeno (1,2,3,CD) pyrene	21,000	12-24
Pyrene	78,000	12-24
2- Methylanthalene	21,000	12-24
4,4-DDT	5,090,000	12-24
4,4-DDE	297,000	12-24
4,4-DDD	182,000	12-24
Concentrations in ppm		
Copper	6,600	"Above Silt"
Lead	11,000	"Above Silt"
Mercury	95	"Above Silt"

The 1985 80 Lister Avenue Site Evaluation concludes that the soil data indicated that the surficial fill layer was contaminated, and the contamination extended to the greatest depths on the northern boundary of the site adjacent to the Passaic River where the fill is thickest (PAS-00127273).

According to the 1985 120 Lister Avenue Evaluation and the 1987 ROD, of 72 soil samples collected to a depth of 60 inches and analyzed for TCDD, 54 had identifiable concentrations ranging from 0.19 to 490 ppb. Of 15 samples analyzed for TCDD from 60 to 132 inches, 10 had identifiable concentrations of TCDD ranging from 0.23 to 93.7 ppb (PAP-00150859). The following is summary of the maximum detected concentrations of COCs (PAS-00125867-72):

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Maximum Detected Concentrations of COCs in Soil		
120 Lister Avenue Site Evaluation - May 1985		
COC	Maximum Detected Concentration (ppb)	Depth (in inches below ground surface)
Concentrations in ppb		
2,3,7,8,-TCDD	>490	6-12
2,4-D	280	6-12
2,4,5-T	400	6-12
Acenaphthene	2,400	6-12
Fluoranthene	15,000	12-24
Napthalene	1,800	12-24
Benzo(a) anthracene	16,000	12-24
Benzo(a)pyrene	16,000	12-24
Benzo (b) fluoranthene	4,100	6-12
Benzo (k) fluoranthene	5,400	0-6
Chrysene	12,000	12-24
Acenaphthylene	2,000	6-12
Anthracene	3,900	6-12
Benzo (g,h,i) perylene	3,800	6-12
Fluorene	2,500	6-12
Phenanthrene	15,000	12-24
Indeno (1,2,3,CD) pyrene	4,000	12-24
Pyrene	39,000	12-24
2- Methylnapthalene	15,000	12-24
4,4-DDT	480,000	0-6
4,4-DDE	7,500	6-12
4,4-DDD	17,100	0-6
Concentrations in ppm		
Copper	350	0-6
Lead	880	12-24
Mercury	10.3	0-6

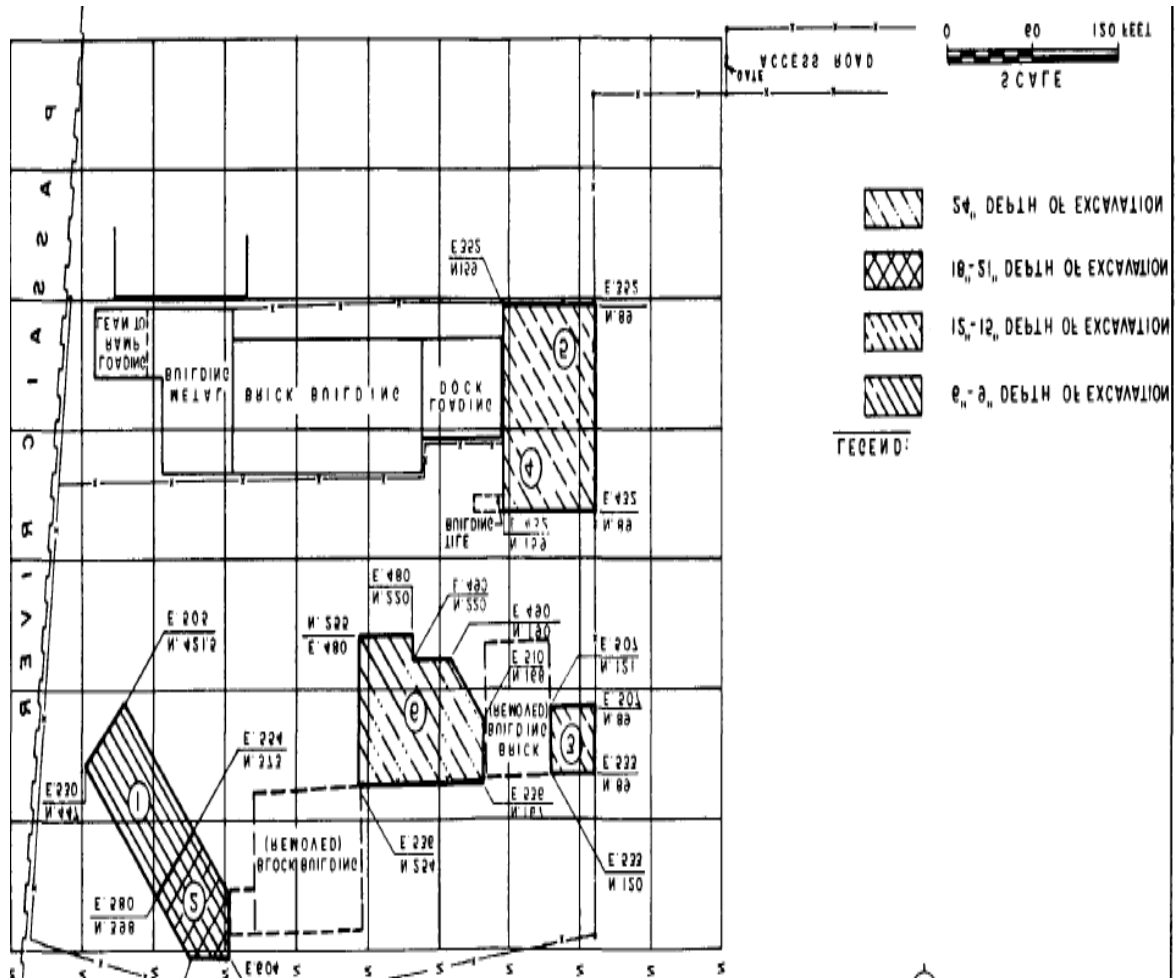
The 1985 120 Lister Avenue Evaluation also notes that six soil samples were collected for dioxin analysis after excavation of five "hot spots" that were identified. Samples from excavation Nos. 1 and 3 were below the "acceptable level" of 7.0 ppb after the removal of 6 and 12 inches of soil, respectively. Excavation No. 2 required removal of 18 inches of soil before the dioxin level dropped to less than 7.0 ppb. Both excavations Nos. 4 and 5 showed "high levels" of dioxin (19.1 and 31.0 ppb, respectively) after 12 inches of soil was removed; no further testing was performed on samples from these locations (PAS-00125853).

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A figure depicting the locations of the "hot spots" is presented below (PAS-00125843):



According to a *Review of Certain Information Related to the 80 Lister Avenue Site, Newark, New Jersey*, prepared by Woodward-Clyde Consultants, dated May 1987 (the document does not state for whom the report was prepared), "concentrations of dioxin on and in the vicinity of the 80 Lister Avenue property correspond generally with the locations of the manufacturing and handling of compounds found to contain dioxin; are consistent with accidental releases, spillages, and leakage over time; and appear to be inconsistent with deposits of such compounds as the result of dumping or other incidents . . ." (PAP-00154203).

According to the 1987 ROD, the 1984 investigation indicated that hazardous substances were being released from the site to the Passaic River through the routes of groundwater migration and surface runoff of stormwater. The 1987 ROD also notes that the investigation identified TCDD and other hazardous substance in Passaic River sediments, that a separate study of the contamination of Passaic River sediments was being conducted by Diamond at the time, and that results of that study showed that the more recent sediments contained relatively little TCDD compared to older sediments.

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The 1987 ROD concludes that the data suggested that releases of TCDD to the Passaic River were much greater in the past during the period of pesticide production at the site than at the present (PAP-00150861).

An Assessment of Potential Sources of Release of Dioxin to the Environment from Reported Manufacturing Operations and Activities at the Diamond Shamrock Facility, 80 Lister Avenue, Newark, New Jersey (related to Diamond Shamrock v. Aetna, et al, prepared for the Defense Steering Committee) dated May 29, 1987, states that according to the 1985 80 Lister Avenue Site Evaluation, an estimated 96.2 pounds of dioxin were present in soil at the 80 Lister Avenue site (PAP-00160133). The report also notes that a dioxin concentration of 75 ppm "reported in the pit near the river was likely the result of autoclave discharges, scrubber effluent discharge, or anisole still releases." (PAP-00160135). The report also notes that "estimated quantities of dioxin released, based on particular discharges that have been documented, fall short of the 96.2 pounds reported by I.T." (Diamond's consultant) (PAP-00160135). The report describes the following sources of dioxin from the Lister facility:

- "Airborne emissions (particulates, fumes) were likely a source of dioxin migration. . . . [d]uring the 1950's, emissions from the TCP building were discharged to the atmosphere by exhaust fans. . . . [f]ume exposure was present in TCP production According to John Burton, the plant manager in the 1950's, the pressure from the autoclave was relieved by venting to the atmosphere after each autoclave batch reaction, indicating gaseous and likely vapor releases to the atmosphere. Based on Diamond Shamrock operating reports from the period November 1966 to July 1969, about 58 autoclave batch reactions occurred per month The venting system reportedly posed 'problems of contamination' as noted in a November 1968 operating report." (PAP-00160076).
- "Reportedly, organic particulates were controlled to 10 pounds per day by a scrubber by the late 1960's, with sodium trichlorophenolate (NaTCP) "mist" emissions controlled to 0.06 pounds per hour from the 1.2 pounds per hour that would have been emitted on an uncontrolled system. Scrubber effluents in which dioxin was likely present would have been discharged to the sewer, to a pit near the river, or to the river. Sources to the scrubber included losses from the T reactor, vapor losses from acidification and dust formed in the flaking process." (PAP-00160076).
- "The 1960 explosion in the autoclave where NaTCP was being manufactured could have released as much as one-third of a pound of dioxin. The explosion may also have indirectly caused dioxin discharge by disturbing "concrete slabs" and "drums" in the area." (PAP-00160076).
- "Other incidental discharges may have resulted from at least five rupture disc releases, . . . causing releases of material to the atmosphere, to the river, and possibly to a pit." (PAP-00160076).

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- “Discharges also occurred from reported leaks in the autoclave, from the TCP recovery tank that “burped over” on at least one occasion, from reported leakage in the acidification tank, and possibly from the TCP intermediate storage tank which reportedly presented a ‘pollution and safety hazard’. According to a 1968 operating report, TCP was also lost due to its limited solubility in acid-water and, when wastewaters were discharged, the solubilized TCP possibly carried some dioxin with it. In addition, NaTCP storage tank residue flushing would have likely caused the release of dioxin-containing materials into the environment.” (PAP-00160077).
- “Also suspected for their potential to release dioxin are the stripping unit, which separated anisole from NaTCP, and filter units, which separated product streams from impurities. According to former Diamond Shamrock employees, the stripper residues were flushed into the river or to a sewer sump, while a small amount of spillage occurred at the unit's sample tap. The condenser tubes in the unit also had leakage problems, while process wastewaters from the stripper were routed to the river. With respect to filters, dioxin would likely have accumulated in filter cakes. Dioxin also was likely carried over into product or with filter washwaters, which, in turn, were sometimes discarded. In addition, the sewerage of acid used to regenerate the carbon purification column was another means for the release of dioxin into the environment.” (PAP-00160077).
- “The T area was also a likely source of release of dioxin containing materials. The T centrifuge and a manhole on the T reactor were reportedly sources of fume exposure, while odor problems and evidence of material discharge reportedly existed during the process of flaking T acid. Particulate releases from this flaking operation were a likely source of release of dioxin-containing materials.” (PAP-00160077).
- “Plugging problems in lines and pumps were reported in depositions and operating reports. Disassembling and flushing of pipes, as well as reported leakage in transfer and product lines, would have contributed to further releases of dioxin.” (PAP-00160077).
- “Process wastewaters were discharged in large volumes to the Passaic River before 1956. These discharges continued after 1956 with some of the wastewaters going to the sewer. Reportedly, 100 tons of unrecycled 2,4,5-T effluents per year were discharged into the Passaic River in 1959. Sources of these wastes include filter and ester wash water. Sewer and sump samples reported in a 1985 report prepared for Diamond Shamrock by I.T. Corp., et al, titled ‘Site Evaluation, 80 Lister Avenue’ noted eight sumps that were sampled. All samples contained dioxin ranging from 19.5 to 9,160 parts per billion (ppb) (PAP-00160077-78).
- “Materials that were discharged to the sumps reportedly included discharges from the TCP area, sulfuric acid from the scrubbers, process streams related to the anisole stripper, and chlorophenolic wastes. Process wastewaters were routed to a sump in the area of the manufacturing building (2,4-dichlorophenoxyacetic acid (D) and T), with the overflow discharging to a sewer. Cleaning of accumulated residues from the sumps was reportedly a ‘dirty, messy operation’ which might have resulted in the discharge of dioxin-containing materials.” (PAP-00160078).

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- “According to depositions, there are indications that general maintenance and housekeeping practices also contributed to dioxin releases. Maintenance would have included flushing of residue from process vessels and discarding of old pipes and debris. “Gunk from tanks’ was reportedly discarded during plant shutdown. Some evidence of ‘poor housekeeping’ was also noted at the riverfront, where drums and equipment were reportedly stored on a concrete pad. In addition, spillage in quality control sampling procedures and disposal of unused or wasted samples would have resulted in further discharge of dioxin into the environment.” (PAP-00160078).
- “Packaging and transport would likely have contributed to some release of dioxin-containing materials. The ‘bagging’ area reportedly had a certain amount of dust, and any spillage in loading and transport for shipping may have gone into the ground since depositions did not indicate any special practices of isolating or cleaning up spills. Furthermore, truck traffic likely provided an additional means for dioxin-contaminated dust migration in the vicinity of the site.” (PAP-00160078).
- “The aforementioned 1985 report projected that 96.2 pounds of dioxin are contained in the soil at the 80 Lister Avenue site. Based on an assessment of potential dioxin (2,3,7,8-TCDD) content in documented releases, the total projected amount of dioxin would appear to be far less than the 96.2 pounds reported. This assessment suggests that the bulk of the dioxin on site arose from routine process emissions through leaks and operations that allowed for material to be lost. Based on available discovery documents, such as depositions and operating reports from the late 1960's, it appears that these discharges were likely persistent throughout the period of operation of the Diamond Shamrock plant.” (PAP-00160078).

According to an undated *Remedial Design Investigation Report*, which states it was prepared pursuant to the Consent Decree entered into by the State of New Jersey and OCC, soil sampling occurred at the site in June 1994 “to confirm and delineate the dioxin concentrations in some areas of the Site and to measure the concentration of dioxin in areas of the Site where there are no data.” (PAP-00160409).

TCDD was detected at concentrations as high as 50,000 ppb in a sample collected from zero to six inches below ground surface (PAP-00160413). The location of this sample is not described in the text of the report, but appears to be located northwest of the warehouse and west of a debris pile (PAP-00160400).

According to the *Moomaw Report*, soil samples were collected in 1984, 1994, and 1997. The 1984 and 1994 data also are discussed in previous paragraphs above. According to the report, for all three datasets, dioxin was detected at all locations in at least one depth interval sampled. “The highest concentration, at 50,000 ppb, was found in 1994 on the west side of the process building near the autoclave and carbon column For the other years sampled, the highest concentrations were 19,500 ppb in 1984 and 4,790 ppb in 1997 in the area between the process, manufacturing, and warehouse buildings.” (PAP-00164660).

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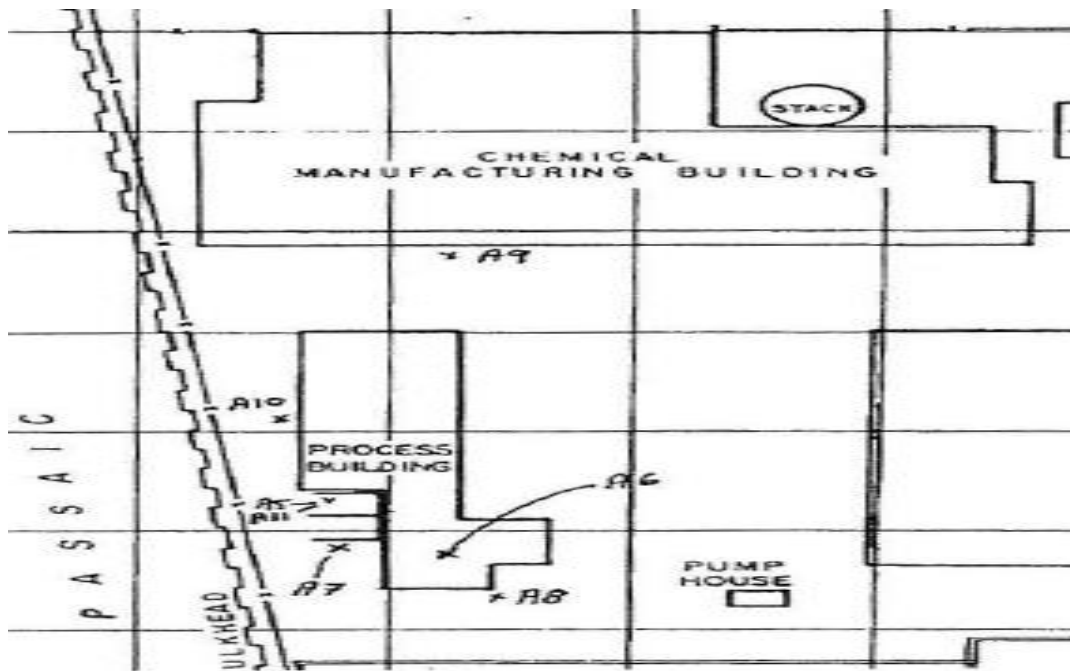
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The report states that many of the areas sampled around the process and manufacturing buildings had concentrations comparable to that found in Diamond's TCP in the 1960s. The report goes on to state that "[m]uch lower concentrations (50 ppb) were found in areas away from the process and manufacturing buildings, likely originating from occasional spills, process emissions, the 1960 explosion, or subsequent construction." The report concludes that the "dioxin contamination detected in these soil samples is consistent with, and was caused by, releases from Diamond's TCP and 2,4,5-T manufacturing operations." (PAP-00164660).

Sampling at the 80 Lister facility in 1992 showed PCBs in sumps and tanks as follows (see map below for location of samples):

80 Lister Sampling					
Sample	PCB-77 (ng/g)	PCB-105 (ng/g)	PCB-118 (ng/g)	PCB-126 (ng/g)	PCB-169 (ng/g)
A5-Sump Residue-Mixed Soil/Liquid Matrix	4.3	4.0	6.5	--	0.77
A6-T4CB Tank Residue	1.4	0.36	0.5	--	0.12
A7-T4CB Unloading Line	0.38	0.81	5.0	--	0.24
A8-Anisole Still Soil	4.1	7.7	19.0	1.4	0.43
A9-Sump Residue	27	11	18	1.0	--
A10- Sump Residue-- Mixed Soil/Liquid Matrix	2.5	23	33	0.23	0.084
A11-Adjacent to Sump	2.2	53	180	0.37	0.038

(PAP-00210639)



(PAP-00210629)

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As reported by a *Draft Focused Feasibility Study for Comparison of the Consent Decree Remedy and Hypothetical Excavation and Incineration Alternatives, Diamond Alkali Superfund Site, Newark, New Jersey*, prepared for Chemical Land Holdings, Inc., dated August 11, 1997 (1997 FFS), soil sampling data were collected for dioxin during the Site Evaluation and the Remedial Design Investigation, both discussed in previous above. The following is a summary of the data as presented in the 1997 FFS:

- At 80 Lister Avenue, the data in the upper two feet of soil indicated “widespread” dioxin concentrations above preliminary remediation goals (PRGs).⁵ “The dioxin concentration exceeds 7 ppb in 101 of 117 samples (86 percent) collected within the upper two feet of soils and exceeds 1 ppb in 114 of 117 samples (97 percent).” (PAP-00160672) The maximum concentration detected was 50,000 ppb (PAP-00160682).
- At 80 Lister Avenue, “[t]he next data set available was at the interface between the Fill and the underlying Silt layer, which was encountered at approximately 8 feet below grade across most of the Site and as deep as 16 feet below grade near the existing bulkhead along the Passaic River. Samples collected directly above the Silt layer also indicate the presence of dioxin above PRGs. The dioxin concentration exceeds 7 ppb in three of eight samples (38 percent) collected directly above the Silt layer, and exceeds 1 ppb in five of eight samples (62 percent)” (PAP-00160673). The maximum concentration detected was 71.8 ppb (PAP-00160684).
- The majority of the samples collected from the 120 Lister Avenue property during the Site Evaluation were within the upper two feet of soil. Dioxin concentrations exceeded 7 ppb in 18 of 81 samples (22 percent) collected within the upper two feet of soil, and exceeded 1 ppb in 45 of 81 samples (56 percent) (PAP-00160673). The maximum concentration detected was 520 ppb (PAP-00160686).
- At 120 Lister Avenue, at depths greater than two feet, samples were collected in 1.5-foot increments. The number of samples for each depth interval within the fill varied from one to seven. The dioxin concentrations exceeded 7 ppb in five of 26 samples (19 percent), and exceeded 1 ppb in eight of 26 samples (30 percent) (PAP-00160673). The maximum concentration detected was 155 ppb (PAP-00160687).

The 1997 FFS notes that for dioxin, two PRGs were considered: 1) a soil cleanup standard of 1 ppb listed in Appendix II of the Judicial Consent Decree, and 2) a PRG of 7 ppb that was considered in a 1985 Feasibility Study. As noted in the 1987 ROD and the Judicial Consent Decree, the 1 ppb PRG for dioxin is a soil concentration that was developed by the Center for Disease Control and had been applied at cleanups throughout New Jersey. The 7 ppb PRG was used for interim remedial activities on the 120 Lister Avenue property, which were performed during 1984-85 (PAP-00160698):

⁵ The PRGs were taken from the 1985 FS (a dioxin PRG of 7 ppb), from the Judicial Consent Decree, and from soil cleanup criteria published by NJDEP (1996) if no soil cleanup standard is listed in the Judicial Consent Decree for a hazardous substance (PAP-00160672).

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The following is a summary of maximum detected concentrations of COCs detected above the PRGs as listed in the 1997 FFS (PAP-00160682-88):

Exceedances of Preliminary Remediation Goals at 80 Lister Ave			
Contaminant of Concern	Preliminary Remediation Goal	Maximum concentration 0-2 feet	Maximum Concentration >2 feet
Concentrations in ppb			
2,4,6-Trichlorophenol	10,000	1,700,000	360,000
2,4,5-Trichlorophenol	50,000	7,500,000	270,000
Fluoranthene	10,00	64,000	None reported
Naphthalene	10,00	11,000	16,000
Benzo (a) anthracene	10,000	47,000	None reported
Benzo (a) pyrene	660	44,000	None reported
Benzo (k) fluoranthene	4,000	71,000	None reported
Chrysene	40,000	120,000	None reported
Phenanthrene	10,000	61,000	None reported
Indeno (1,2,3,CD) pyrene	4,000	21,000	None reported
Pyrene	10,000	78,000	None reported
2-Methylnaphthalene	10,000	21,000	14,000
4,4'-DDT	9,000	5,090,000	None reported
4,4'-DDE	9,000	297,000	None reported
4,4'-DDD	12,000	182,000	370,000
Concentrations in ppm			
Copper	170	730	6,600
Lead	400	2,300	11,000
Mercury	1	39	95

Exceedances of Preliminary Remediation Goals at 120 Lister Ave			
Contaminant of Concern	Preliminary Remediation Goal	Maximum concentration 0-2 feet	Maximum Concentration > 2 feet
Concentrations in ppb			
2,3,7,8-TCDD	7	520	155
Fluoranthene	10,000	15,000	None reported
Benzo (a) anthracene	10,000	16,000	None reported
Benzo(a)pyrene	660	16,000	None reported
Benzo (k) fluoranthene	4,000	4,100	None reported
Phenanthrene	10,000	39,000	None reported
Pyrene	10,000	39,000	None reported

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Exceedances of Preliminary Remediation Goals at 120 Lister Ave			
Contaminant of Concern	Preliminary Remediation Goal	Maximum concentration 0-2 feet	Maximum Concentration > 2 feet
2-Methylnaphthalene	10,000	15,000	None reported
4,4'-DDT	9,000	480,000	None reported
4,4'-DDD	12,000	17,100	None reported
Concentrations in ppm			
Copper	170	350	690
Lead	400	880	530
Mercury	1	1.9	None reported

According to a the 1997 FFS, an estimated 38,122 cubic yards of soil were present at 80 Lister Avenue with dioxin concentrations greater than 7 ppb, and 50,246 cubic yards of soil were present at 80 Lister Avenue with dioxin concentrations greater than 1 ppb (PAP-00160689-90).

Groundwater Data

According to the 1985 80 Lister Avenue Site Evaluation and the 1987 ROD, as part of the investigation that took place in 1984, 17 groundwater samples were collected. The following table identifies the maximum detected concentrations of COCs in groundwater (PAP-00150855; PAS-00127164-68):

Maximum Detected Concentrations of COCs in Groundwater	
80 Lister Avenue Site Evaluation - February 1985	
COC	Maximum Detected Concentration (ppb)
Concentrations in ppb	
2,3,7,8,-TCDD	10.4
2,4,6-Trichlorophenol	11,000
Acenaphthene	30
Fluoranthene	120
Napthalene	480
Benzo (a) anthracene	8
Anthracene	4
Fluorene	32
Phenanthrene	110
Pyrene	46
2- Methylnaphthalene	900
2,4-D	27,000
2,4,5-T	5,600
4,4-DDT	22,000
4,4-DDE	54

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Maximum Detected Concentrations of COCs in Groundwater	
80 Lister Avenue Site Evaluation - February 1985	
COC	Maximum Detected Concentration (ppb)
<i>Concentrations in ppb</i>	
4,4-DDD	13,000
Copper	2.9
Lead	47
Mercury	0.16

The 1985 80 Lister Avenue Site Evaluation concludes that analysis of samples collected from eight on-site wells confirmed the presence of dioxin in groundwater, and that contamination was present in 15 of 17 water samples collected, ranging from 0.0059 ppb to 10.4 ppb. The report also concludes that the results indicated that "contamination is greatest at the north end of the site along the river, near the process and chemical manufacturing buildings" (PAS-00127261).

According to the May 1985 Site Evaluation for 120 Lister Avenue and the 1987 ROD, dioxin was not detected in any of the five ground water samples collected from the 120 Lister Avenue site (PAP-00150860; PAS-00125854). 4,4-DDT, 4,4-DDE, and 4,4-DDD were detected at maximum concentrations of 2.5 ppb, 3.2 ppb, and 1.8 ppb, respectively (PAS-00125875). Copper, lead, and mercury were detected at maximum concentrations of 1.46 ppb, 6.6 ppb, and 0.062 ppb, respectively (PAS-00125876).

According to an undated Remedial Design Investigation Report, which states it was prepared pursuant to the Consent Decree entered into by the State of New Jersey and OCC, groundwater was sampled in 1994. The following table identifies the maximum detected concentrations of COCs in groundwater (PAP-00160507-08).

Maximum Detected Concentrations of COCs in Groundwater	
Remedial Design Investigation - 1994	
COC	Maximum Detected Concentration
<i>Concentrations in ppb</i>	
2,3,7,8,-TCDD	28,000
Napthalene	17
Fluoranthene	99
Phenanthrene	61
<i>Concentrations in ppb</i>	
4,4-DDT	87.7
4,4-DDE	32
4,4-DDD	47.4
Copper	715
Lead	2,200
Mercury	12.7

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According to an August 29, 2019 *Site Evaluation Work Plan Addendum* for the Diamond Alkali Superfund Site, findings presented in a March 29, 2019 Site Evaluation Report confirmed the presence of dense non-aqueous phase liquid (DNAPL) on the Site. EPA has directed OCC to conduct “additional investigation activities . . . to delineate the vertical extent of [DNAPL] that was previously identified below the organic silt layer underlying the Site.” (PAP-00422963).

Fate and Transport

A 2014 paper *Fate and Transport of Hydrophobic Organic Chemicals in the Lower Passaic River: Insights from 2,3,7,8-Tetrachlorodibenzo-p-Dioxin* by Israelsson, et. al. concludes the following:

- “H[ydrophobic] O[rganic] C[hemicals (HOCs)] trapping processes within the LPR have been highly effective in the past; approximately $\frac{3}{4}$ of the LPR/Newark Bay 2,3,7,8-TCDD inventory was estimated to reside in the lower six miles and more than half within approximately 1 mile of the dominant 2,3,7,8-TCDD source location (not accounting for recent removal actions).
- Upstream transport processes (tidal pumping and gravitational circulation) have distributed HOCs as far upstream as approximately RM 14.
- Trapping of 2,3,7,8-TCDD downstream of RM 2 has likely been more effective than trapping upstream of RM 4, consistent with expectations based on system geomorphology, the strong influence of freshwater discharge on net sediment transport, and HOC-specific transport processes.
- Although the LPR 2,3,7,8-TCDD signal declines moving away from the LPR mouth (based on concentrations and the ratio of 2,3,7,8-TCDD to total TCDD), the signal remains visible in lower Newark Bay” (PAP-00149637).

A 2015 paper regarding fingerprinting by Quadrini, et. al., states that peak 2,3,7,8-TCDD concentrations in the lower Passaic River cores ‘date to the 1950s, as evidenced by the horizontal shaded bands established through radioisotope age dating This peak date is consistent with the known 2,3,7,8-TCDD discharge history from the site [Diamond facility]. Also evident in the cores are secondary 2,3,7,8-TCDD peaks, roughly at 80 inches . . . and 55 inches . . . below the sediment surface. The timing of these secondary peaks generally coincides with the February 1960 trichlorophenol autoclave explosion at the site that released 2,3,7,8-TCDD and other compounds to the surrounding area The decline in 2,3,7,8-TCDD concentrations after this explosion presumably reflects smaller mass discharge from the site after the replacement of the main processing facility in 1961 and the end of 2,4,5-trichlorophenoxyacetic acid production in 1969 . . . , as well as a natural recovery of surface sediments. Surface 2,3,7,8-TCDD concentrations in the 3 cores range from 418 ng/kg to 776 ng/kg, roughly 3.0 to 4.5 orders of magnitude lower than the peak 2,3,7,8-TCDD concentrations.” (PAP-00162747).

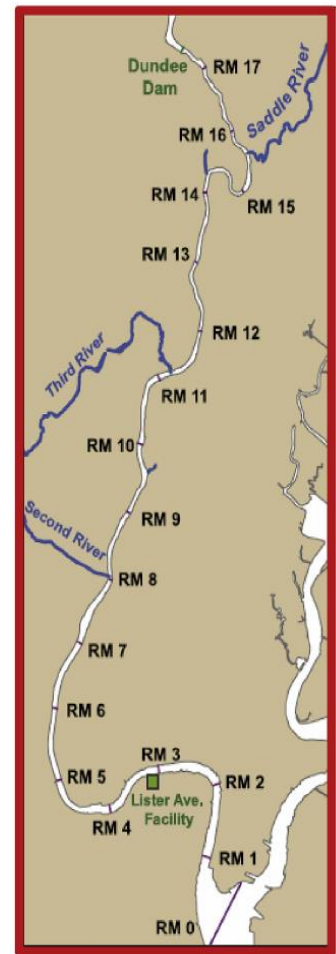
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In conclusion, “[t]he sediments of the lower 14 miles of the lower Passaic River contain a relatively uniform PCDD/F composition that resembles the composition of sediments adjacent to the Lister Avenue site, which in turn matches the composition of samples taken on the upland site. The match has been demonstrated using several fingerprints: 15-congener PCDD/F composition, PCDD/F homolog composition, 1,3,7,8-TCDD to 2,3,7,8-TCDD ratios, and 2,3,7,8-TCDD to total TCDD ratios. The match strongly indicates that the Lister Avenue site is the dominant source of the examined PCDD/Fs over this region. The upstream influence of the site, which extends to approximately RM 14 (congener ratios indicate a gradually declining influence over the RM 13–15 interval in particular), is consistent with upstream contaminant transport and salinity intrusion considerations, particularly during the peak site discharge period” (PAP-00162754).

According to *Parette, et. al. (2018)*, the 80 Lister facility is the major source of TCDD in the sediments of the Passaic River. A reconstruction of the chemical processes at the site identified dilutionfiltration, a TCP purification process that was utilized prior to September 1954, as the major pathway by which TCDD was discharged to the Passaic River from the Lister Avenue site. This process concentrated TCDD in a waste organic sludge that was subsequently discharged to the river. Annual TCP production, coupled with modeling to predict concentrations of TCDD, indicate that TCDD discharges to the LPR from this one process (20-80 kg) are consistent with mass estimates of TCDD in the river (30-50 kg). TCDD and cesium-137 data from nearby sediment cores support this purification process as a major pathway by which TCDD entered the river (PAP-00210169-176). The paper also states that the highest concentrations of TCDD in the LPR were found in sediments directly adjacent to the Lister Avenue site, and approximately 70% of the estimated TCDD in the LPR is contained within one RM of this site. The bulk of the TCDD is concentrated between RM 2 and RM 4, with only 10% above RM 6 (PAP-00210170).



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OKONITE COMPANY

Facility Name, Address and Size: Okonite Company, Inc., (Okonite) Canal and Jefferson Streets, Passaic, NJ, 07055 (PAS-00108491). The current site address is 220 Passaic Street, Passaic, NJ 07055 (PAS-00123415). However, Okonite sold this property in February 1993 and has not operated this site since July 5, 1989 (PAP-00240078). The current acreage of the site is 13 acres (PAP-00256257). The available references did not include information on the number of site employees and typical work shifts.

- 1. Business Type:** The Okonite Company was founded in 1878 making it one of the original insulators of electrical wire and cable in the United States. Okonite is the premier manufacturer of high quality insulated electric wire and cable, specializing in high voltage cable (up to 345kV), medium voltage cables (from 5 to 35kV) and low voltage power, control and instrumentation cables. The cables are manufactured with a variety of materials including laminated polypropylene paper, thermosetting and thermoplastic insulation and jacketing compounds. Many products feature Okonite's Okoguard all EPR insulation system. These constructions are further complemented by a wide selection of metallic and nonmetallic coverings to provide added mechanical protection to the wire and cable for various environments (PAS-00102060).

The basic raw materials were copper, aluminum, rubber, and plastic. Okonite also manufactured the rubber compounds used to insulate the electrical conductors. This process involved the mixing and extruding of solid and liquid raw materials. Raw materials included clay, paraffin, carbon black, lead, and zinc oxide (PAP-00256284, PAP-00242981-82, 90).

- 2. Time Period of Ownership/Operations**

Operator: 1885 to 1989 (PAP-00240078)

Owner: 1885 to 1993 (PAP-00240078)

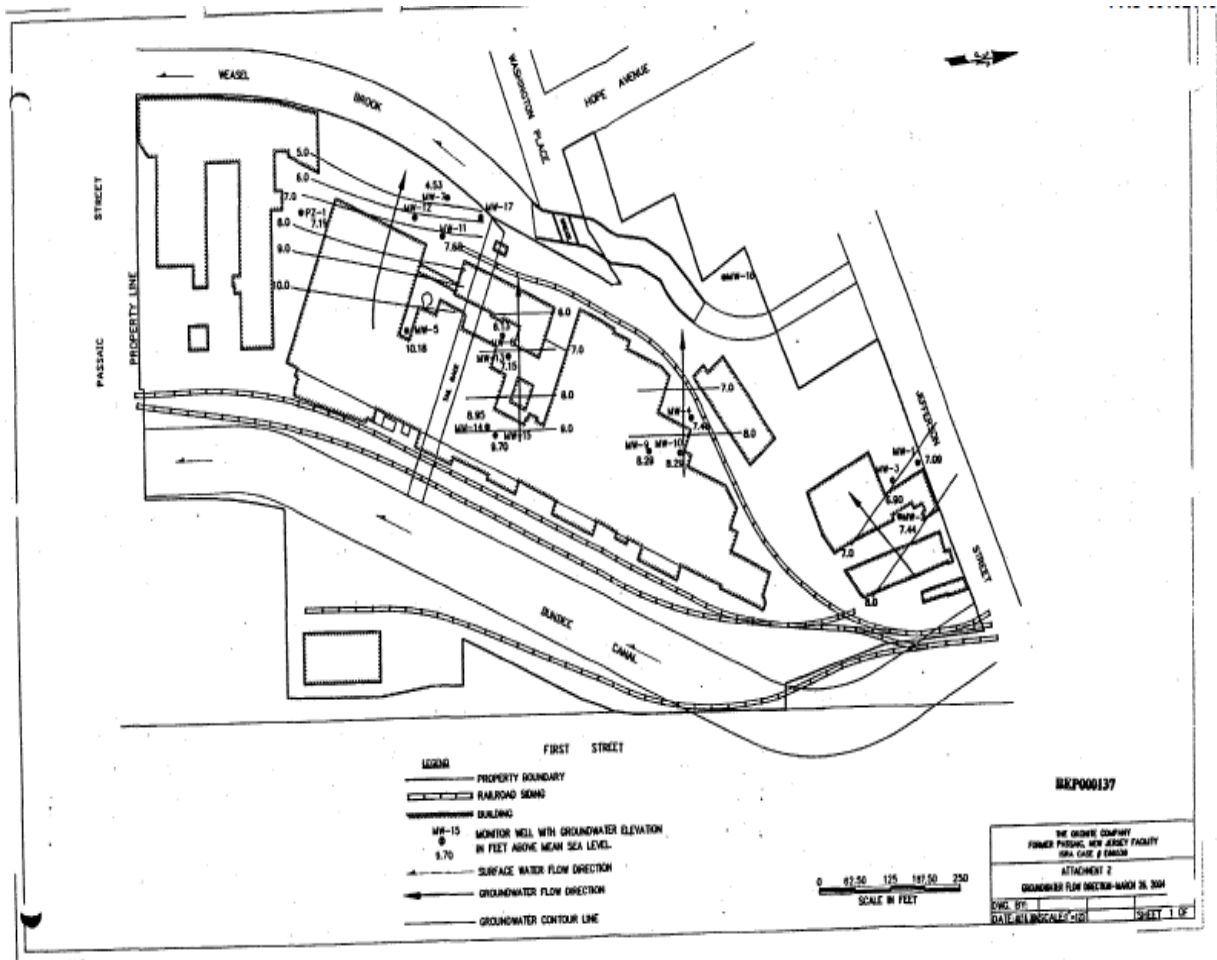
- 3. Operational History/COC Use and Presence at the Facility**

As mentioned in Section 1 above, the Okonite facility manufactured electrical power cables at its Passaic Plant. Processes included wire drawing, stranding, taping, shielding, insulating, jacketing, and testing. Basic raw materials used were copper, aluminum, rubber, and plastic. Okonite also manufactured the rubber compounds used to insulate the electrical conductors. Raw materials used in these processes included clay, paraffin, carbon black, lead and zinc oxide (PAP-00256284, PAP-00242981-82, 90).

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(PAS-00102115)

Based on review of available documents, the following Areas of Concern (AOCs) were identified in a February 1991 *Result of Sampling Plan Implementation and Supplemental At-Peril Activities* report prepared by Environmental and Energy Consultants, Inc. (ECC) on behalf of Okonite:

Okonite AOCs	
Area A – Facility drummed hazardous waste storage area	Area F2 – Piping trench in Engine Room and nearby area
Area B1 – Drummed raw material storage area	Area G – 8000-gallon steel gasoline Underground Storage Tank (UST) and abandoned 1,000-gallon UST of uncertain usage
Area B2 – Unpaved empty drum storage area	Area I1 – 9,000-gallon concrete drawing fluid pit
Area C – Paved empty drum storage area	Area I2 – Exterior area west of drawing fluid pit, location of historic boring I-2

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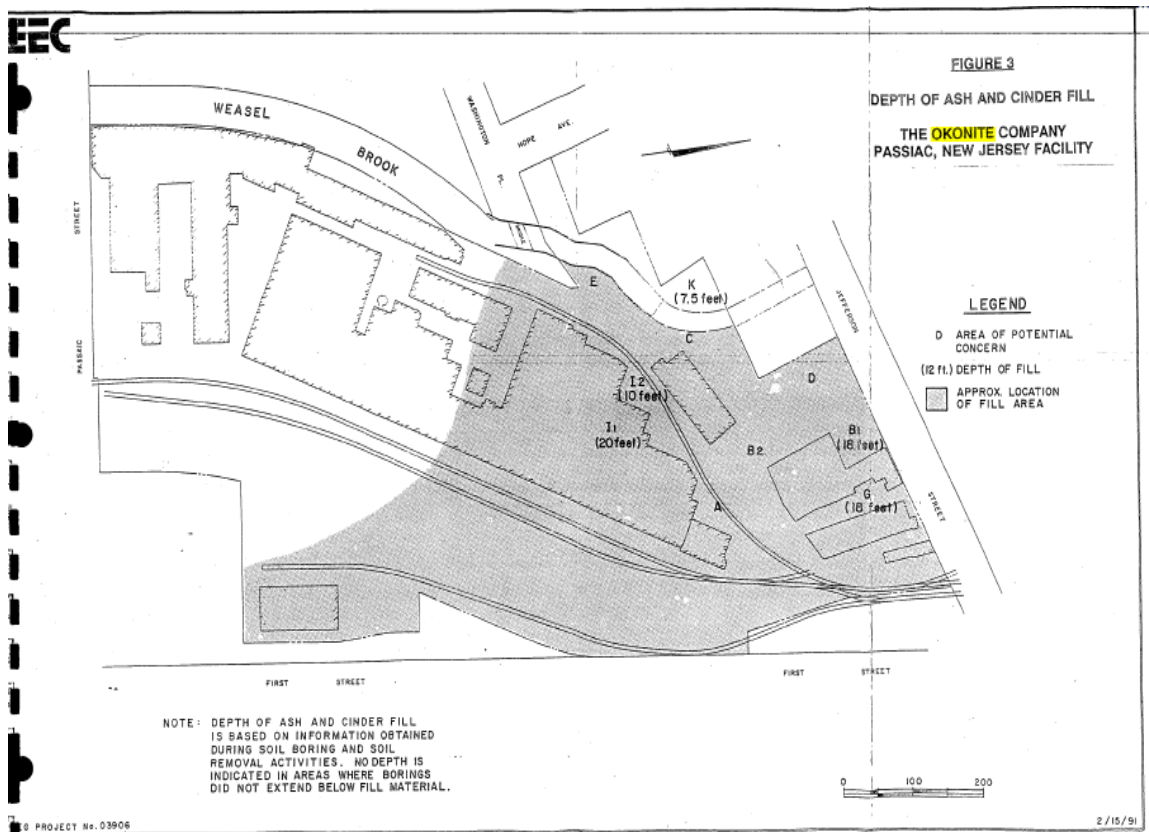
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Okonite AOCs	
Area D – Historic drummed raw material storage area	Area K – Unpaved area of oil-stained soils with water softener resin beads and tar-like material
Area E – 300-gallon, concrete encased, steel underground storage tank (UST) historically used to store waste kerosene, oil, and solvents	Area M – Banbury mixer area
Area F1 – 76,000-gallon concrete No. 6 fuel oil UST	Various drainage structures – Catch basins, drains, troughs and machinery pits, most with permitted outfalls to Weasel Brook

(PAP-00244643-84, 725)

Of the AOCs identified at the Site, Historic Fill was identified at Area 16 (PAP-00260097). Several other AOCs were determined to be located within areas of historic fill material, as discussed further in the following sections. The AOCs discussed in the above table are generally co-located with historic fill material (including ash and cinder), as determined by extensive subsurface investigations at the Site.

The AOCs identified in the 1991 report are depicted on the figures below:

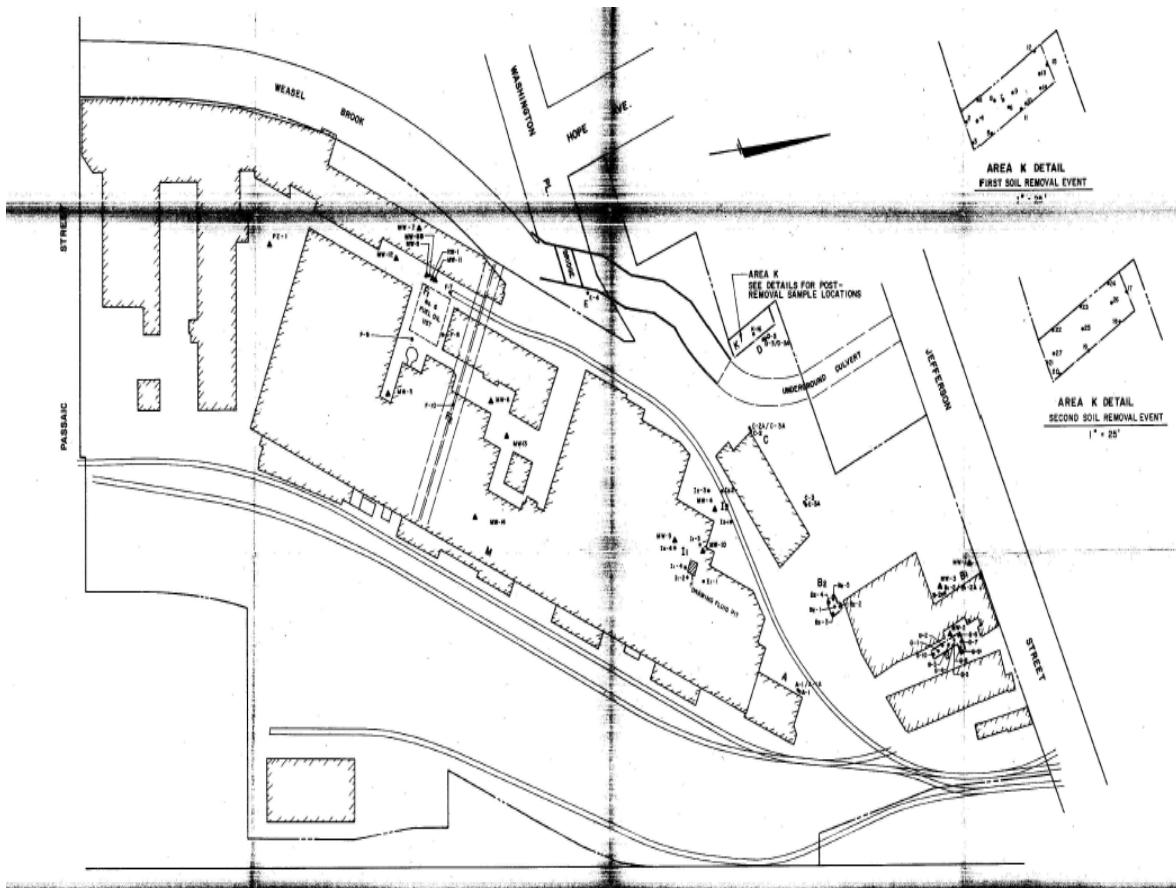


(PAP-00244638)

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(PAP-00244631)

Presented below is a summary of findings at the different AOCs as reported by the *Results of Sampling Plan Implementation and Supplemental At-Peril Activities* dated February 1991.

Areas A, B1, and D

Area A is the facility hazardous waste drum storage area. The area is controlled by a concrete spill control system. Waste chlorinated and non-chlorinated solvents and oils were stored in this area.

Areas B1 and D are recent and historic drummed material storage areas, respectively. Materials stored in these areas include all liquid materials used in facility processes. All three areas are asphalt paved. No evidence of contamination (i.e., oil staining, odor and/or elevated monitoring instrument response) was observed in any of these areas during the historic sampling events (PAP-00244643).

The New Jersey Department of Environmental Protection (NJDEP) approved No Further Action (NFA) for these AOCs A, B1 and D in their letter dated April 11, 1994 (PAP-00240168-70).

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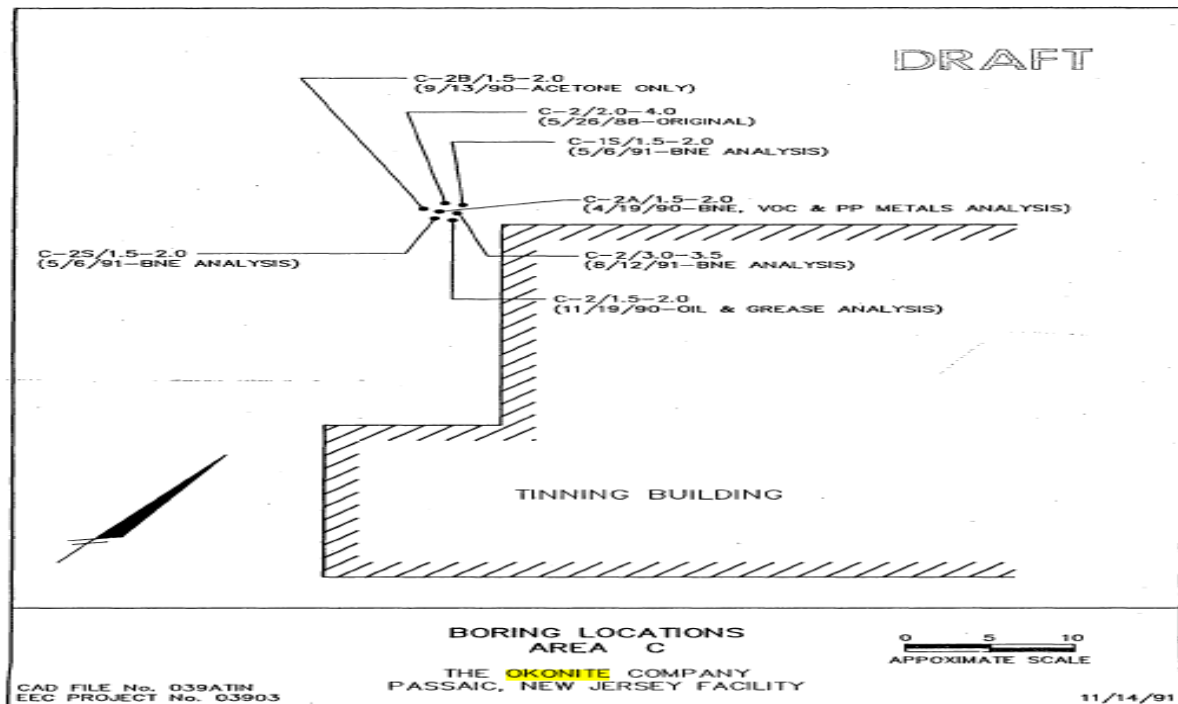
Area B2

This area is a small unpaved area that was used for storage of empty drums that were previously used for liquid raw materials used in the facility processes.

The NJDEP approved NFA for AOC B2 in their letter dated April 11, 1994 (PAP-00240168-70).

Area C

Area C is a paved area and was used to store empty drums of facility process-related materials.



(PAP-00244335)

Area E

This area was the location of an abandoned approximately 300-gallon steel UST encased in concrete that was historically used to store waste kerosene and other compounds that may have been used as degreasers at the facility. The UST was properly decommissioned through removal in accordance with facility Decontamination/Decommissioning Plan. The UST was disposed as scrap metal along with the USTs from Area G. No evidence of a release was found in the removal of the USTs (PAP-00244653). The NJDEP approved NFA for Area E in their letter dated April 11, 1994 (PAP-00240168-70).

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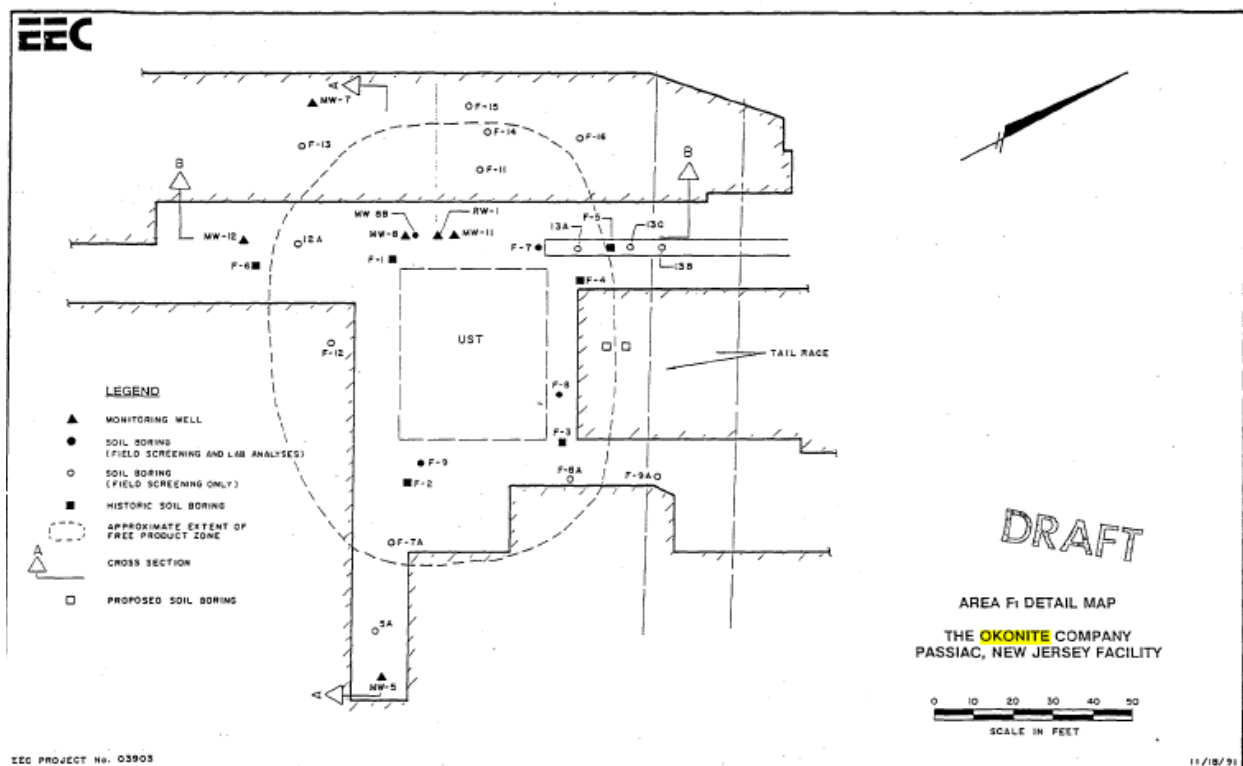
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Area F1

This area is the location of a 76,000-gallon concrete UST that was used to store No. 6 fuel oil. The UST was installed in approximately 1922. The UST was emptied and cleaned in 1991 (PAP-00244655).

Area F2

This area consists of a piping trench located beneath a metal plate in the floor of the facility engine room, which houses the facility air compressors. This area was identified as an area of potential concern subsequent to conditional sampling plan approval during implementation of decontamination/decommissioning activities for machinery pits and other subgrade structures at the facility. Condensate from the air compressors was determined to have been historically discharged to the trench, which was earthen-bottomed (PAP-00244657).



(PAP-00244342)

Area G

Area G is the location of an 8,000-gallon gasoline UST. In addition, a small, approximately 1,000-gallon, abandoned UST that contained sand and a small amount of water, was discovered immediately adjacent to the gasoline UST during removal of the gasoline UST. Both USTs were properly closed (PAP-00244657-8). The NJDEP approved NFA for Area G in their letter dated April 11, 1994 (PAP-00240168).

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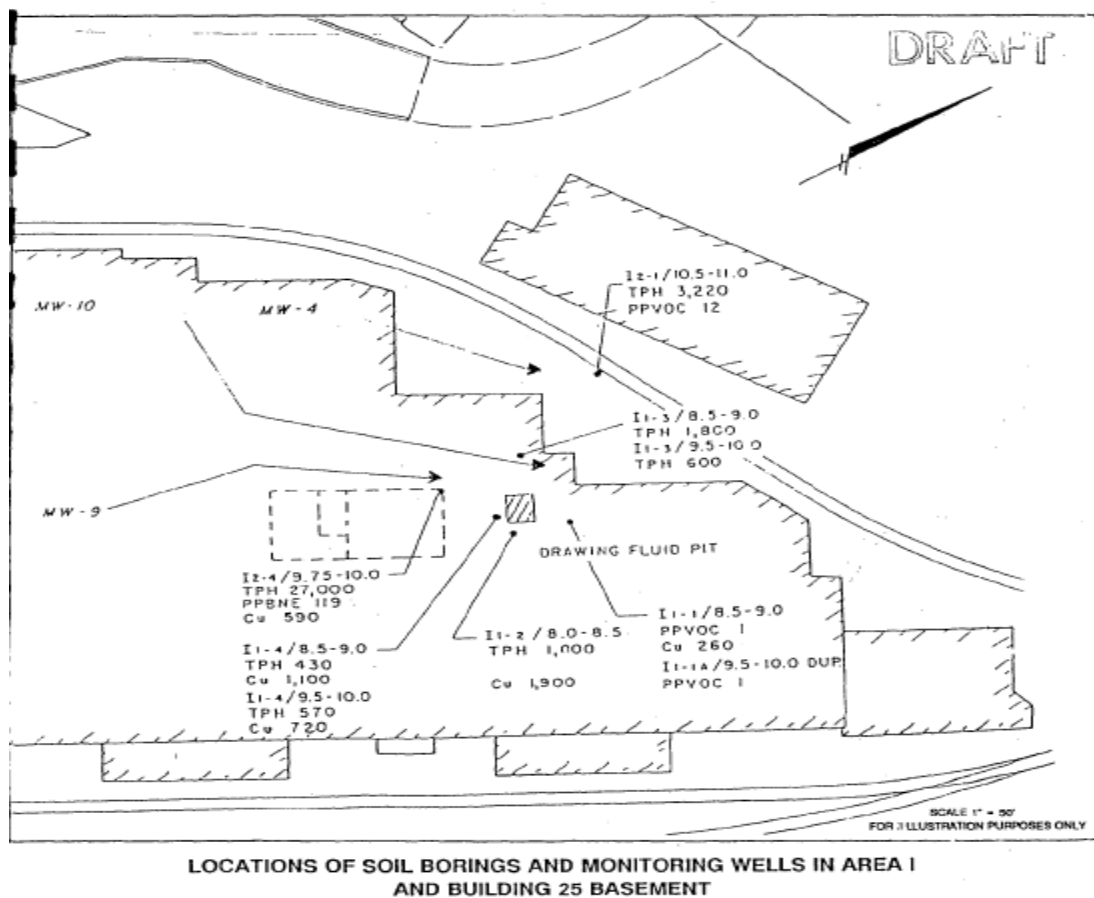
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Area I1

This area is the location of a 9,000-gallon concrete pit that was used to store drawing fluid for copper wire. The pit was installed in approximately 1976. No evidence of contamination was encountered above the water table (PAP-00244661). NJDEP approved NFA for Area I1 in 1994 (PAP-00240168-70).

Area I2

This area is an exterior area to the west of the drawing fluid pit and the basement area of Building 25 in which above ground drawing fluid tanks were located (PAP-00244664).



(PAP-00244344)

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area (PAP-00244665).

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Area M

This area was identified as an area of potential environmental concern during facility decontamination/decommissioning activities when the Banbury mixer (rubber compounding machine) was removed. The area is approximately 20 by 10 feet in size and, the bottom of the pit is approximately 3 feet below grade, and consisted of several concrete sub-chambers (PAP-00244684). The sub-chambers were mostly filled with soil and sediment but also contained minor amounts of rubber compounding waste. Removal of the fill material revealed that the floors and walls of the sub-chambers are not continuous throughout the structure (i.e., gaps are present) (PAP-00244684).

This Area was subsequently divided into Areas M1 and M2. Area M1 was described as the pit beneath the former Banbury mixer inside the main building and Area M2 was the groundwater in the vicinity of the former Banbury mixer. Area M2 contained different COCs than those found in Area M1. Based on the distribution of impacted soils and field observations, the impacts at Area M1 were attributed to not only the Banbury pit but also fill material in the area or historical operations through the former wooden floor in the area of that building (PAP-00245788-93).

Drainage Structures and Machinery Pits

Several drainage structure, machinery pits, and discharge points to Weasel Brook were identified at Okonite (PAP-00244725). Detailed information on the discharge points to Weasel Brook is summarized in Sections 4 and 5 below.

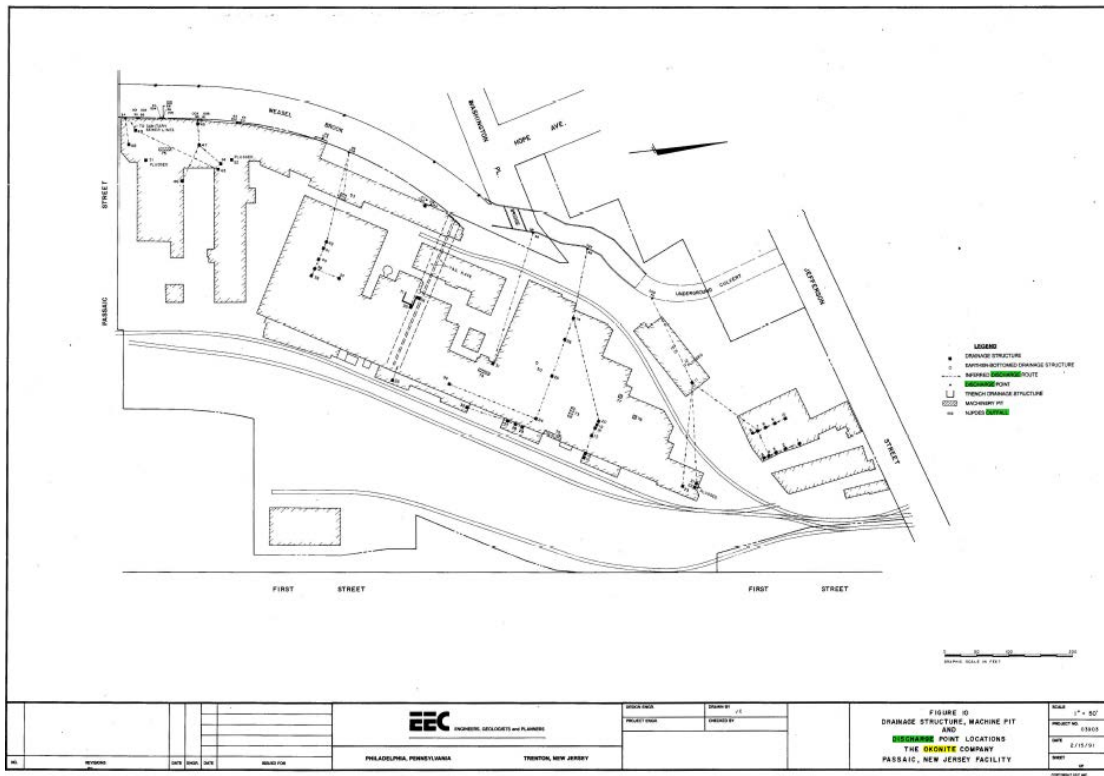
Most of the interior drainage structures in the facility were identified as access-ways to storm drain lines. These structures were covered with metal plates and were not located near machinery except for one structure 15 (which fed into 16-20). In addition, most of the facility contact and non-contact cooling water was discharged directly to Weasel Brook, via underground piping under the New Jersey Pollution Discharge Elimination System (NJPDES) permit (PAP-00244720).

In addition to drains 13, 18-20, 30, 53, and 54, and the Weasel Brook discharge points, three areas of potential environmental concern were identified in the course of decontamination and decommissioning activities. These were the stream bank adjacent to Building 37, where lead strips were found; the baghouse area, an unpaved area beneath the Banbury mixer where oil-stained soils were observed; and the hydraulic lift pit, the location of lift equipment for the loading dock, where oil-stained soils were also found (PAP-00245798-802).

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(PAP-00244375)

According to the December 17, 2003 *Remedial Action Report (RAR)*, no sediments are present at the site; however, Weasel Brook forms the western boundary of the site. Okonite discharged wastewater to Weasel Brook via several outfall pipes, as permitted by NJPDES Permit No. NJ0002615 (PAP-00259165).

4. Identified COCs

- PCBs (used)
- PAHs (used, detected)
- Copper (used, detected)
- Lead (used, detected)
- Mercury (detected)

PCBs

According to a December 14, 1992 Administrative Consent Order Affidavit, PCBs were present in exterior transformers (PAP-00240541)..

PAHs

The International Carbon Black Association states that PAHs can only be extracted from the surface of industrially manufactured Carbon Black under vigorous laboratory conditions, and that the risks to human health associated with presence of PAHs originating from carbon black in its final product form is extremely low (PAP-00264260). Based on review of the *Result of Sampling Plan Implementation and Supplemental At-*

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Peril Activities dated February 1991 and *Results of Supplemental Sampling Plan Implementation and Additional At-Peril Activities*, dated October 1992, PAHs were detected in soil samples collected from the various AOCs. Presented below are the PAH concentrations detected at the various AOCs:

Max PAH Concentrations detected at AOCs (mg/kg)						
PAH	Area A	Area B1	Area B2	Area C	Area D	Area E
Acenaphthylene			0.029 J	0.23 J		0.031 J
Acenaphthene				5.8		0.026 J
Anthracene				9.4		0.065
Benzo(a)anthracene		0.45	1	23	0.019	0.36
Benzo(a)pyrene		0.23 J		16	0.012	0.3 J
Benzo(b)fluoranthene			0.25 J	1.5	0.014	1.1
Benzo(g,h,i)perylene				17		0.36 J
Benzo(k)fluoranthene			0.2 J	15	0.012	
Chrysene		0.47	3.7	22	0.024	0.45
Fluoranthene	0.061 J	0.66	1.7 J	42	0.037	0.74
Fluorene				0.23 J		0.034 J
Indeno(1,2,3-cd)pyrene			0.73	17	0.003	0.44
Naphthalene				1.8		
Phenanthrene	0.027 J	0.54	0.84	43	0.014	0.57
Pyrene	0.095 J	1.1	1.9	46	0.024	0.73

J: Estimated
(PAP-00244645-56, PAP-0245810-1)

Areas A, B1 and D

Soil sampling conducted at Areas A and B1 in 1990 showed carcinogenic polycyclic aromatic hydrocarbons (cPAHs) were below 10 milligrams per kilogram (mg/kg) (PAP-00244643-44).

The following PAHs: phenanthrene, fluoranthene, and pyrene were detected at estimated concentrations of 0.027 mg/kg, 0.061 mg/kg, and 0.095 mg/kg collected from sample A-1 at a depth of 2.5-3.0 feet below ground surface (ft bgs) (PAP-00244645).

The following PAHs: phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, and benzo(a)pyrene were detected at concentrations of 0.54 mg/kg, 0.66 mg/kg, 1.1 mg/kg, 0.45 mg/kg, and 0.23 mg/kg from sample B-2B at a depth of 1-1.5 ft bgs (PAP-00244646).

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The following PAHs: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene were detected at concentrations of 0.019 J mg/kg, 0.012 J mg/kg, 0.014 J mg/kg, 0.012 J mg/kg, 0.024 J mg/kg, 0.037 mg/kg, 0.003 J mg/kg, 0.014 J mg/kg, and 0.024 J mg/kg collected from sample D-3A at a depth of 1.5-2.0 ft bgs (PAP-00245811).

Historical soil sampling data from Areas A, B1, and D complied with applicable RDCSCC and were subsequently granted NFA by the NJDEP on April 11, 1994 (PAP-00240168-70).

Area B2

Soil sampling conducted in 1990 at Area B2 showed concentrations of PAHs to be below 10 mg/kg. The following PAHs; acenaphthylene, phenanthrene, anthracene, fluoranthene, pyrene, and benzo(a)anthracene were detected at maximum concentrations of 0.0029 J mg/kg, 0.84 mg/kg, 0.17 J mg/kg, 1.7 mg/kg, 1.9 mg/kg, 1 mg/kg (from sample B2-4 at a depth of 4.5-5 ft bgs); chrysene was detected at 3.7 mg/kg in sample B2-3 at a depth of 4.5-5 ft bgs; and, benzo(b)fluoranthene and benzo(k)fluoranthene were detected at estimated concentrations of 0.25 J mg/kg and 0.2 J mg/kg (from sample B2-2 at a depth of 4.5-5 ft bgs) (PAP-00244648-49). The soil was disposed at the American Landfill in Youngstown, Ohio and the excavation was backfilled with offsite fill after laboratory results revealed that contamination had been removed (PAP-00244650). The NJDEP approved NFA for AOC B2 in their letter dated April 11, 1994 (PAP-00240168-70).

Area C

Area C is a paved area and was used to store empty drums of facility process-related materials. Two soil borings were completed within one foot of previous borings C-2 and C3 to a depth of three feet. No evidence of contamination (i.e., staining or odor) was observed in either boring. Samples were collected from 1.5 to 2 ft bgs and analyzed for volatile organic compounds (VOCs), base neutral compounds (BNs), and priority pollutant metals. Subsequent sampling of Area C on August 12, 1991, was conducted to determine whether the previous concentrations were representative of conditions in the area or were related to the presence of coal, ash or cinder fill material. Three additional soil samples were collected and analyzed for BNs. Results of this additional sampling revealed that the previous PAH concentrations in sample C-2A/1.5-2 were not representative of conditions in Area C and other samples were compliant with applicable standards (PAP-00245760, 778-79, 804).

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The maximum concentrations of PAHs detected during the two soil sampling events were as follows (PAP-00244650-52, PAP-00245810):

Okonite Area C PAH Detections	
Contaminant	Concentration/Sample ID/Depth
Acenaphthylene	0.23 J mg/kg / C-15 at a depth of 1.5-2 ft bgs
Acenaphthene	5.8 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Anthracene	9.4 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Benzo(a)anthracene	23 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Benzo(a)pyrene	16 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Benzo(b)fluoranthene	1.5 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Benzo(g,h,i)perylene	17 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Benzo(k)fluoranthene	15 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Chrysene	22 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Fluoranthene	42 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Fluorene	0.23 J mg/kg / C-2A at a depth of 1.5-2 ft bgs
Indeno(1,2,3-cd)pyrene	17 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Naphthalene	1.8 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Phenanthrene	43 mg/kg / C-2A at a depth of 1.5-2 ft bgs
Pyrene	46 mg/kg / C-2A at a depth of 1.5-2 ft bgs

J: estimated

Following an evaluation of the data, the NJDEP approved conditional NFA for Area C in their April 11, 1994 letter "if Okonite applies appropriate institutional and/or engineering controls" (PAP-00240168-70).

Area E

This area was the location of an abandoned approximately 300-gallon steel UST encased in concrete that was historically used to store waste kerosene and other compounds that may have been used as degreasers at the facility. The UST was properly decommissioned through removal in accordance with facility Decontamination/Decommissioning Plan. The UST was disposed as scrap metal along with the USTs from Area G. No evidence of a release was found in the removal of the USTs. Soil sampling results upon UST removal showed concentrations of phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, and benzo(a)pyrene to be 0.57 mg/kg, 0.065 mg/kg, 0.74 mg/kg, 0.73 mg/kg, 0.36 mg/kg, and 0.3 mg/kg (from sample E-4 collected at a depth of 5.5 ft bgs) (PAP-00244654). Based on the post-removal analytical results, NJDEP approved NFA for Area E in their letter dated April 11, 1994 (PAP-00240168-70).

Area F1

This area is the location of a 76,000-gallon concrete UST that was used to store No. 6 fuel oil. The UST was installed in approximately 1922. The UST was emptied and cleaned in 1991. Soil borings F-7 through F-9 were completed to the northwest, north, east, and west (immediately downgradient) of the UST respectively. These borings were

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completed within ten feet of the UST and to depths of 11 ft. Oil staining and odor were observed in all four borings from depths starting from 7 to 10 ft bgs. Samples for laboratory analyses were collected from 10 to 10.5 ft bgs. Presented below in a tabular format are the concentrations of PAHs detected at Area F1 collected during a 1990 soil sampling event (PAP-00244656):

Okonite Area F1 PAH Detections	
Contaminant	Concentration/Sample ID/Depth
Anthracene	2.4 mg/kg / F-8 / 10-10.5 ft bgs
Benzo(a)anthracene	5.6 mg/kg / F-8 / 10-10.5 ft bgs
Benzo(a)pyrene	5.9 mg/kg / F-8 / 10-10.5 ft bgs
Chrysene	8.8 mg/kg / F-8 / 10-10.5 ft bgs
Fluorene	5 mg/kg / F-8 / 10-10.5 ft bgs
Napthalene	16 mg/kg / F-8 / 10-10.5 ft bgs
Phenanthrene	19 mg/kg / F-8 / 10-10.5 ft bgs

Subsequent to the original sampling, a duplicate sample was collected to evaluate the previous PAH detections at Area F1, identified as sample F-10A/10.5-11. No PAHs were detected in this sample (PAP-00245760, 84).

Multiple soil excavations were conducted at Area F1 in 2002, as well as in 2007 following the demolition of former Building 37 (PAP-00259691; PAP-00264067). Post-excavation soil samples complied with applicable soil standards to the west (toward Weasel Brook) following the 2007 excavation activities (PAP-00264067).

Max PAH Concentrations detected at AOCs (mg/kg)						
PAH	Area F1	Area I1	Area I2	Area K	Drains	Weasel Brook
Acenaphthene				0.36J	1.4	0.58J
Acenaphthylene				0.3J	0.15J	0.95J
Anthracene	2.4			1.5	2.9	2.5J
Benzo(a)anthracene	5.6		0.026 J	5.1	13	14
Benzo(a)pyrene	5.9			3.1	17	24
Benzo(b)fluoranthene				5.5	17	17
Benzo(g,h,i)perylene				3.2	2.7	7.1
Benzo(k)fluoranthene				4	20	27
Chrysene	8.8	0.04 J	0.025 J	6.7	24	18
Dibenzo(a,h)anthracene				0.14 J	1.4	1.8J
Fluoranthene		0.037J	0.05 J	12	36	13
Fluorene	5			0.39 J	1.5	1.5 J
Ideno(1,2,3-cd)pyrene				3.2 J	3.4	5.6
Naphthalene	51		1.8	0.33 J	1.5	0.014J
Phenanthrene	19	0.048J	1.3	8.9	7.7	11
Pyrene		0.052J	0.55	11	21	21

J: estimated
(PAP-00244662-79, PAP-00245836-49, PAP-00259185-7)

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Area I1

This area is the location of a 9,000-gallon concrete pit that was used to store drawing fluid for copper wire. The pit was installed in approximately 1976. No evidence of contamination was encountered above the water table. Two samples for laboratory analyses were collected from each boring from the six-inch interval above that apparently affected by normal fluctuations of the water table (8 to 8.5 or 8.5 to 9 ft) and from the six-inch interval at the bottom of the pit (9.5 to 10 ft). Soil samples collected during a 1990 soil sampling event showed maximum detections of the following PAHs: phenanthrene (0.048 J mg/kg), fluoranthene (0.037 J mg/kg), and chrysene (0.04 J mg/kg), collected from sample I1-3 at a depth of 8.5-9 ft bgs and pyrene (0.052 J mg/kg), from sample I1-4 at a depth of 8.5-9 ft bgs (PAP-00244661-79). NJDEP approved NFA for Area I1 in 1994 (PAP-00240168-70).

Area I2

This area is an exterior area to the west of the drawing fluid pit and the basement area of Building 25 in which above ground drawing fluid tanks were located. Soil borings I2-1 through I2-3 were completed outside the building to the water table at distances of approximately 20 ft to the north, west, and south of I-2 in an effort to determine the source of conditions encountered in the previous boring. A fourth boring, I2-4 was completed to the east of I-2 inside the building in the hole in the basement floor. No evidence of contamination was observed in any of the exterior borings until the water table, which was encountered at a depth of approximately 10 ft bgs. Soil at the water table was oil stained and had an odor of weathered oil. Evidence of contamination in the form of oil staining and odor was observed throughout I2-4. A sample for laboratory analysis was collected within six inches of the water table and analyzed for VOCs, copper, mercury, and lead, with the exception of I2-4, which was not analyzed for mercury and lead (PAP-00244664).

The following PAHs were detected: phenanthrene (0.025 J mg/kg), pyrene (0.031 J mg/kg), and naphthalene (1.8 mg/kg) from sample I2-4 at a depth of 9.75-10 ft bgs; and chrysene (0.025 J mg/kg) and benzo(a)anthracene (0.026 J mg/kg) from sample I2-1B at a depth of 9.5-10 ft bgs (PAP-00244666-67).

Further soil delineation investigations at Area I2 in 1992 were not evaluated for COCs associated with OU2 and included only petroleum hydrocarbons. Based on additional delineation conducted, and the very limited access to this Area due to its location in a building basement, Okonite proposed institutional controls for Area I2 (PAP-00260513, 524, 551). NJDEP conditionally approved institutional controls for Area I2 in 1994 (PAP-00240168, 72).

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area (PAP-00244665). Approximately 200 cubic yards of soil was removed. A total of 15 post-removal soil samples were collected following the

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first excavation on January 23, 1993. Samples were analyzed for TPH, VOCs, BNs, lead, and zinc. Several PAHs were detected in this area following round 1 excavation. The soils removed during the first soil event consisted entirely of ash and cinder fill. The fill in this area contained parts of plumbing fixtures, glass vials, metals lids, etc. (PAP-00244668). Okonite concluded that, due to the analytical results of the first round of post-removal samples, a second soil removal event was required. Subsequently, an additional 100 cubic yards were removed and post-removal sampling was conducted on December 7, 1990. Following the second excavation, 11 post-removal soil samples were collected from the excavation base and the base of the sidewalls and analyzed for TPH, BNs, lead, zinc, mercury, copper, and PCBs. The maximum concentrations of PAHs and metals detected in this area are presented below in a tabular format (PAP-00244669-77).

Okonite Area K PAH Max Detections	
Contaminant	Concentration/Sample ID/Depth
Acenaphthene	0.36 J / K-5 / 5.5-6 ft bgs
Acenaphthylene	0.3 J mg/kg / K-4 / 5.5-6 ft bgs
Anthracene	1.5 mg/kg / K-5 / 5.5-6 ft bgs
Benzo(a)anthracene	5.1 mg/kg / K-9 / 1.5-2 ft bgs
Benzo(a)pyrene	3.1 mg/kg / K-17 / 7-7.5 ft bgs
Benzo(b)fluoranthene	5.5 mg/kg / K-17 / 7-7.5 ft bgs
Benzo(g,h,i)perylene	3.2 J mg/kg / K-5 / 5.5-6 ft bgs
Benzo(k)fluoranthene	4 mg/kg / K-17 / 7-7.5 ft bgs
Chrysene	6.7 mg/kg / K-9 / 1.5-2 ft bgs
Fluoranthene	12 mg/kg / K-5 / 5.5-6 ft bgs
Fluorene	0.39 J mg/kg / K-5 / 5.5-6 ft bgs
Ideno(1,2,3-cd)pyrene	3.2 J mg/kg / K-5 / 5.5-6 ft bgs
Naphthalene	0.33 J mg/kg / K-5 / 5.5-6 ft bgs
Phenanthrene	8.9 mg/kg / K-5 / 5.5-6 ft bgs
Pyrene	11 mg/kg / K-5 / 5.5-6 ft bgs

J: estimated

In the October 1992 *Results of Supplemental Sampling Plan Implementation*, NFA was recommended (PAP-00245760, 806). The NJDEP conditionally approved NFA with the requirement that the previous data be reevaluated to the then-applicable RDCSCC (PAP-00240172-73). The data for sample K-16/9.5-10.0 met then-applicable RDCSCC for BN compounds (PAP-00260518). The NJDEP approved NFA for Area K in their comment letter dated January 20, 1995 (PAP-00240079, 81).

Area M

This area was identified as an area of potential environmental concern during on-going facility decontamination/decommissioning activities when the Banbury mixer (rubber compounding machine) was removed. The area is approximately 20 by 10 feet in size and, the bottom of the pit is approximately 3 feet below grade, and consisted of several concrete sub-chambers. The sub-chambers were mostly filled with soil and sediment but also contained minor amounts of rubber compounding waste. Removal of the fill

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material revealed that the floors and walls of the sub-chambers are not continuous throughout the structure (i.e., gaps are present). The fill material that was removed prior to the submittal of the February 1992 *Results of Sampling Plan Implementation and Supplemental At-Peril Activities* report (approximately 15 cubic yards) was staged beside the pit. A waste classification sample was collected from this material. No PAHs were detected (PAP-00244684).

Drainage Structures

Soil samples were collected, and in some cases soils were removed from drainage structure areas. Samples were analyzed for TPH, VOCs, BNs and metals (PAP-00245793-99). Maximum PAH detections from the drainage structures and pits are presented below:

Max PAH Concentrations detected at Drainage Structures (mg/kg)						
PAH	#13	#18	#19	#20	#30	#54
Acenaphthene			1.4	1.4		0.14 J
Acenaphthylene	0.06 J			0.15 J		
Anthracene	0.21 J	0.026 J		2.6	2.9	0.38 J
Benzo(a)anthracene	1.7	0.1 J	0.18 J	13	13	2.8
Benzo(a)pyrene	2.4	0.075 J		12	17	1.1
Benzo(b)fluoranthene	2.2	0.11 J	0.23 J	14	17	4
Benzo(g,h,i)perylene	1.6	0.066 J		2.7		1.2
Benzo(k)fluoranthene	2.5	0.11 J		11	20	3.1
Chrysene	1.9	0.19 J	0.2 J	24	13	4.1
Dibenzo(a,h)anthracene	0.31 J			1.4		0.46
Fluoranthene	3.4	0.23 J	0.44 J	36	26	
Fluorene	0.019 J			1.5		0.16 J
Ideno(1,2,3-cd)pyrene	0.79			3.4		1.5
Naphthalene	0.035 J			1.5		
Phenanthrene	0.45	0.14 J	0.33 J	5.6	7.7	4
Pyrene	3	0.13 J	0.34 J	21	20	3.9

(PAP-00245836-49)

No sediments are present at the site; however, Weasel Brook forms the western boundary of the site. Okonite collected 13 sediment samples from Weasel Brook in July 1992. The samples were analyzed for metals, VOCs, base neutrals, and total organic carbon. Sample locations were biased towards the areas where outfall pipes discharged to Weasel Brook. Samples of stream bank and/or bottom sediments were collected where available, beneath three of the facility outfall pipes to Weasel Brook and at a location downstream of the facility outfall pipes. Bank and bottom sediment samples were also collected at the furthest upstream end of the brook on the site (PAP-00243477), and at a location downstream of the facility outfall pipes. A sample was not collected at the upstream end of the brook at the property because the brook enters the property boundary in a covered culvert. The bottom of the brook was concrete and stone where it exited the culvert and no sediment was present for sampling. A number of PAHs were detected in two bank sediment samples and three bottom sediment

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samples, including SS-3 at a depth of 0-6 inches. According to the Remedial Action Report (RAR), dated December 17, 2003, the source of these PAHs was unknown. However, a possible source was the historic fill in the area, which also contained PAHs (PAP-00259165). A significant amount of time had passed since Okonite's industrial discharges to the brook ceased. Normal processes of erosion and deposition have likely made sediment conditions at that time non-representative of any impacts Okonite's operations may have had (PAP-00243478).

Presented below are the maximum detected concentrations of PAHs in sediment samples collected from Weasel Brook (PAP-00259185-91):

Okonite Weasel Brook PAH Detections (mg/kg)	
Contaminant	Concentration/Sample ID/Depth
Acenaphthene	0.58 J / SS-4 / 0-6"
Acenaphthylene	0.95 J / SS-7 / 0-6"
Anthracene	2.5 J / SS-7 / 0-6"
Benzo(a)anthracene	14 / SS-4 / 0-6"
Benzo(a)pyrene	24 / SS-4 / 0-6"
Benzo(b)fluoranthene	17 / SS-4 / 0-6"
Benzo(g,h,i)perylene	7.1 / SS-4 / 0-6"
Benzo(k)fluoranthene	27 / SS-4 / 0-6"
Chrysene	18 / SS-4 / 0-6"
Dibenzo(a,h)anthracene	1.8 J / SS-4 / 0-6"
Fluoranthene	13 / SS-2 / 0-6"
Fluorene	1.5 J / SS-7 / 0-6"
Ideno(1,2,3-cd)pyrene	5.6 / SS-4 / 0-6"
Naphthalene	0.014 J / SS-3 / 0-6"
Phenanthrene	11 / SS-2 / 0-6"
Pyrene	21 / SS-4 / 0-6"

J: estimated

On May 5, 2004, additional sediment samples were collected from Weasel Brook at a previous location of SS-3/0-6" collected in 1992 for total organic carbon, TPH, and BNs. During the 2004 sampling event, waste automotive parts were observed in Weasel Brook and had been dumped from the bank opposite of Okonite . (PAP-00258638).

Copper

Based on review of the *Result of Sampling Plan Implementation and Supplemental At-Peril Activities* dated February 1991; copper was only detected in soil samples collected from the following AOCs. Presented below are the copper concentrations at the various AOCs:

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Max Copper Concentrations detected at AOCs (mg/kg)						
Metal	Area C 1.5-2 ft bgs	Area I1 8-8.5 ft bgs	Area I2 9.75-10 ft bgs	Area K 7.5-8 ft bgs	Drain 20	Weasel Brook 0-6" bgs
Copper	95	1,900	590	260	12,000	430

(PAP-00244652, 662, 667, 679; PAP-00245845, PAP-00259186)

Area C

Area C is a paved area and was used to store empty drums of facility process-related materials. Two soil borings were completed within one foot of previous borings C-2 and C3 to a depth of three feet. No evidence of contamination (i.e., staining or odor) was observed in either boring. Samples were collected from 1.5 to 2 ft bgs and analyzed for volatile organic compounds (VOCs) and priority pollutant metals. Copper was detected at a maximum concentration of 95 mg/kg in sample C-3A at a depth of 1.5-2 ft bgs (PAP-00244652).

Area I1

This area is the location of a 9000-gallon concrete pit that was used to store drawing fluid for copper wire. The pit was installed in approximately 1976 and was approximately 9.5 ft bgs. Soil borings were completed on all four sides of the pit. Soil borings could not be completed adjacent to the pit on the north and west sides due to numerous subsurface obstructions such as metal plates, subsurface concrete slabs, etc., that were historically located in this area. A total of nine borings were installed. No evidence of contamination was encountered above the water table in any of the soil borings. Two samples for laboratory analyses were collected from each boring from the six-inch interval above the water table (8 to 8.5-9 ft bgs) and from a six-inch interval at the bottom of the pit (9.5-10 ft. bgs). All samples were analyzed for VOC and copper. Copper was detected at a maximum concentration of 1,900 mg/kg from sample I1-2B at a depth of 8-8.5 ft bgs (PAP-00244662). NJDEP approved NFA for Area I1 in 1994 (PAP-00240168-70).

In their comment letter dated April 11, 1994, NJDEP noted that the concentration of 1,900 mg/kg copper did not meet the then-applicable Residential Direct Contact Soil Cleanup Criteria (RDCSCC) (PAP-00240168, 70). Although elevated metal concentrations were detected in downgradient wells in one round of samples, the concentrations were attributed to incomplete field filtering and not to dissolved metals. As the soil sample was collected at 8 feet below grade and beneath the building, this did not require remediation. NJDEP approved NFA for Area I1 in 1994 (PAP-00240168-70).

Area I2

This area is an exterior area to the west of the drawing fluid pit and the basement area of Building 25 in which above ground drawing fluid tanks were located. Soil borings I2-1 through I2-3 were completed outside the building to the water table at distances of approximately 20 ft to the north, west, and south of I-2 in an effort to determine the source of conditions encountered in the previous boring. A fourth boring, I2-4 was

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completed to the east of I-2 inside the building in the hole in the basement floor. No evidence of contamination was observed in any of the exterior borings until the water table, which was encountered at a depth of approximately 10 ft bgs. Soil at the water table was oil stained and had an odor of weathered oil. Evidence of contamination in the form of oil staining and odor was observed throughout I2-4. A sample for laboratory analysis was collected within six inches of the water table and analyzed for VOCs, copper, mercury, and lead, with the exception of I2-4, which was not analyzed for mercury and lead (PAP-00244664). Copper was detected at a concentration of 590 mg/kg in sample I2-4 at a depth of 9.75-10 ft bgs (PAP-00244667).

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area. Approximately 200 cubic yards of soil was removed during the first soil removal event. A total of 15 post-removal soil samples were collected following the first excavation on January 23, 1993. Samples were analyzed for TPH, VOCs, BNs, lead, and zinc. The soils removed during the first soil event consisted entirely of ash and cinder fill. The fill in this area contained parts of plumbing fixtures, glass vials, metals lids, etc. Okonite concluded that, due to the analytical results of the first round of post-removal samples, a second soil removal event was required. Subsequently, an additional 100 cubic yards were removed and post-removal sampling was conducted on December 7, 1990. Following the second excavation, 11 post-removal soil samples were collected from the excavation base and the base of the sidewalls and analyzed for TPH, BNs, lead, zinc, mercury, copper, and PCBs (PAP-00244676). The maximum detected concentration of copper in this area during the second soil sampling event was 260 mg/kg collected from sample K-25 at a depth of 7.5-8 ft bgs (PAP-00244679). The NJDEP approved NFA for Area K in their comment letter dated January 20, 1995 (PAP-00240081).

Drainage Structures

Soil borings were advanced and samples were collected from the drainage structures. Maximum detected copper concentrations are presented in the following table:

Max Copper Concentrations detected at Drainage Structures (mg/kg)			
Drain #	Sample	Depth	Concentration
13	DR-3	0-6"	4,300
18	DR-2	0-6"	870
19	19	4.5-5 ft	300
20	DR-1	0-6"	12,000
30	30	2-2.5 ft	260
53	DR53	0.5 ft	100
54	DR54	2.5-3 ft	860

(PAP-00245837, 41, 43, 45, 47, 49)

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The highest copper concentration was located at Drain 20. Soil was removed in the vicinity of Drains 18-20 to a depth of 5 ft bgs. Copper was not detected in the Drain 20 post-removal sample. The removed soil was sample and classified as non-hazardous but was disposed in bulk with other waste as hazardous waste D008 (PAP-00245795).

No sediments are present at the site; however, Weasel Brook forms the western boundary of the site. Okonite discharged wastewater to Weasel Brook via several outfall pipes, as permitted by NJPDES Permit No. NJ0002615 (PAP-00259165). As documented in a Priority Pollutants Monitoring Report, dated December 6, 1977, copper was found at a concentration of 27 J micrograms per liter (µg/L) in the raw influent water. Effluent samples from water discharged from Site operations during that same sampling event exhibited lower concentrations of copper, at 12 J and 15 J µg/L, indicating that the manufacturing process did not introduce a measurable quantity of copper to the waste stream (PAP-00264228, 55). As required by NJEDP, Okonite collected 13 sediment samples from Weasel Brook in July 1992. The samples were analyzed for metals, VOCs, base neutrals, and total organic carbon. Sample locations were biased towards the areas where outfall pipes discharged to Weasel Brook. Samples of stream bank and/or bottom sediments were collected where available, beneath three of the facility outfall pipes, at the furthest upstream end of the brook on the site (PAP-00243477), and at a location downstream of the facility outfall pipes. A sample was not collected at the upstream end of the brook at the property boundary because the brook enters the property in a covered culvert. The bottom of the brook was concrete and stone where it exited the culvert and no sediment was present for sampling (PAP-00243477). The most downstream sample location (SS-8, located adjacent to the former facilities southwest corner) had a copper concentration of 48 mg/kg (PAP-00243537). However, the most upstream sample (SS-3) had a copper concentration of 57 mg/kg (PAP-00243535). However, sample SS-4 at a depth of 0-6 inches had a concentration of 430 mg/kg (PAP-00243535).

Lead

Based on review of the RAR, dated December 17, 2003, lead was detected only at the following AOCs:

Max Lead Concentrations detected at AOCs (mg/kg)							
Metal	Area C 1.5-2 ft bgs	Area G 6.5-7 ft bgs	Area I2 9-9.5 ft bgs	Area K 1.5-2 ft bgs	Area M 3.5-4 ft bgs	Drain 13	Weasel Brook 0-6" bgs
Lead	270	370	106	87,500	6,700	110,000	8,200

(PAP-00244652, 659, 667, 672; PAP-00245837; PAP-00259186)

Area C

Area C is a paved area and was used to store empty drums of facility process-related materials. Two soil borings were completed within one foot of previous borings C-2 and C3 to a depth of three feet. No evidence of contamination (i.e., staining or odor) was observed in either boring. Samples were collected from 1.5 to 2 ft bgs and analyzed for

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volatile organic compounds (VOCs) and priority pollutant metals. Lead was detected at a maximum concentration of 270 mg/kg in sample C-3A at a depth of 1.5-2 ft bgs (PAP-00244652).

Area G

Area G is the location of a former gasoline 8,000-gallon UST. In addition, a small, approximately 1,000-gallon, abandoned UST that contained sand and a small amount of water, was discovered immediately adjacent to the gasoline UST during removal of the gasoline UST. Both USTs were properly closed (PAP-00244657-58). Following removal of the two USTs, field observations and monitoring instrument responses showed that a small amount of contaminated soil remained in place at the west end of the excavation. Analytical results showed that lead was detected at a concentration of 370 mg/kg from sample G-3 at a depth of 6.5-7 ft bgs (PAP-00244659). The NJDEP approved NFA for Area G in their letter dated April 11, 1994 (PAP-00240168-9).

Area I2

This area is an exterior area to the west of the drawing fluid pit and the basement area of Building 25 in which aboveground drawing fluid tanks were located. Soil borings I2-1 through I2-3 were completed outside the building to the water table at distances of approximately 20 feet to the north, west, and south of I-2 in an effort to determine the source of conditions encountered in the previous boring. A fourth boring, I2-4 was completed to the east of I-2 inside the building in the hole in the basement floor. No evidence of contamination was observed in any of the exterior borings until the water table, which was encountered at a depth of approximately 10 feet bgs. Soil at the water table was oil stained and had an odor of weathered oil. Evidence of contamination in the form of oil staining and odor was observed throughout I2-4. A sample for laboratory analysis was collected within six inches of the water table and analyzed for VOCs, copper, mercury, and lead, with the exception of I2-4, which was not analyzed for mercury and lead (PAP-00244664). Lead was detected at a concentration of 106 mg/kg in sample I2-1B at a depth of 9-9.5 ft bgs (PAP-00244667).

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area. Approximately 200 cubic yards of soil was removed. A total of 15 post-removal soil samples were collected following the first excavation on January 23, 1993. Samples were analyzed for TPH, VOCs, BNs, lead, and zinc. The soils removed during the first soil event consisted entirely of ash and cinder fill. The fill in this area contained parts of plumbing fixtures, glass vials, metals lids, etc. Okonite concluded that, due to the analytical results of the first round of post-removal samples, a second soil removal event was required. Subsequently, an additional 100 cubic yards were removed and post-removal sampling was conducted on December 7, 1990. Following the second excavation, 11 post-removal soil samples were collected from the excavation base and the base of the sidewalls and analyzed for TPH, BNs, lead, zinc, mercury, copper, and PCBs (PAP-00244676). The maximum detected concentration of

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lead in this area during the second soil sampling event was 87,500 mg/kg collected from sample K-9 at a depth of 1.5-2 ft bgs (PAP-00244672).

In the October 1992 Results of Supplemental Sampling Plan Implementation, NFA was recommended (PAP-00245806). The NJDEP conditionally approved NFA with the requirement that the previous data be reevaluated to the then-applicable RDCSCC (PAP-00240168, 72-3). The NJDEP approved NFA for Area K in their comment letter dated January 20, 1995 (PAP-00240081).

Area M

This area was subsequently divided into Areas M1 and M2. Area M1 was described as the pit beneath the former Banbury mixer inside the main building and Area M2 was the groundwater in the vicinity of the former Banbury mixer. Area M2 contained different COCs than those found in Area M1. Soil sampling conducted in late 1991-early 1992 consisted of the installation of 36 soil borings and collection of 22 soil samples for TPH, BN, VOC, lead and zinc analysis. Lead concentrations ranged from not detected to 6,700 mg/kg; the concentration was below 400 mg/kg in all but one sample, M-16-3.5-4. The average lead concentration in Area M1 was approximately 400 ppm. Based on the distribution of impacted soils and field observations, the impacts at Area M1 were attributed to not only the Banbury pit but also fill material in the area or historical operations through the former wooden floor in the area of that building (PAP-002457 88-91).

Drainage Structures and Machinery Pits

Soil borings were advanced and samples were collected from the drainage structures. Maximum detected lead concentrations are presented in the following table:

Max Lead Concentrations detected at Drainage Structures and Pits (mg/kg)			
Drain # / Location	Sample	Depth	Concentration
13	DR-3	0-6"	110,000
18	DR-2	0-6"	17,000
19	DRX-2	6-6.5 ft	2,700
20	DR-1	0-6"	9,800
30	30	2-2.5 ft	990
53	DR53	0.5 ft	1,100
54	DR54	2.5-3 ft	490
Stream Bank	SB-1	1-1.5 ft	1,800
Baghouse	BH-3N	0-0.5 ft	2,200

(PAP-00245837, 41, 43, 45, 47, 49, 60, 62)

The highest lead concentration was located at Drain 13. Soil was removed in the vicinity of the drain to a depth of 4.5 ft bgs. Lead was detected in a post-removal sample at a concentration of 37 mg/kg, which was below the action level at the time. The excavation was backfilled with stone and capped with concrete (PAP-00245794).

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No sediments are present at the site; however, Weasel Brook forms the western boundary of the site. Okonite discharged wastewater to Weasel Brook via several outfall pipes, as permitted by NJPDES Permit No. NJ0002615. As documented in a Priority Pollutants Monitoring Report, dated December 6, 1977, lead was found at a concentration of 2,200 J micrograms per liter ($\mu\text{g/L}$) in the raw influent water originating from the PVWC. Effluent samples from water discharged from Site operations during that same sampling event exhibited lower concentrations of lead, at 49 J and 700 J $\mu\text{g/L}$, indicating that the manufacturing process did not introduce a measurable quantity of lead to the waste stream (PAP-00264228, 55). As required by NJDEP, Okonite collected 13 sediment samples from Weasel Brook in July 1992. The samples were analyzed for metals, VOCs, base neutrals, and total organic carbon. Sample locations were biased towards the areas where outfall pipes discharged to Weasel Brook. Samples of stream bank and/or bottom sediments were collected where available, beneath three of the facility outfall pipes, at the furthest upstream of the brook on the site (PAP-00243477), and at a location downstream of the facility outfall pipes. A sample was not collected at the upstream end of the brook at the property boundary because the brook enters the property in a covered culvert. The bottom of the brook was concrete and stone where it exited the culvert and no sediment was present for sampling. Lead was detected in two bank samples. According to the RAR, dated December 17, 2003, lead was detected at a maximum concentration of 8,200 mg/kg from sample SS-2 at a depth of 0-6 inches (PAP-00259186). A significant amount of time had passed since Okonite's industrial discharges to the brook ceased. Normal processes of erosion and deposition have likely made sediment conditions at that time non-representative of any impacts Okonite's operations may have had (PAP-00243478). In addition, there was evidence of others dumping into this section of the river as evidenced by observations of industrial discharges from a number of outfall pipes directly across the brook from Okonite (PAP-00243478), and waste automotive parts that had been dumped from the bank of Weasel Brook opposite of Okonite (PAP-00258638).

Mercury

Based on review of the *Result of Sampling Plan Implementation and Supplemental At-Peril Activities* dated February 1991; mercury was only detected in soil samples collected from the following AOCs. Presented below are the mercury concentrations at the various AOCs:

Max Mercury Concentrations detected at AOCs (mg/kg)					
Metal	Area C 1.5-2 ft bgs	Area I2 9.0-9.5 ft bgs	Area K 7-7.5 ft bgs	Drain 19 6-6.5 ft bgs	Weasel Brook 0-6" bgs
Mercury	0.56	0.8	430	40	18

(PAP-00244652, 662, 667, 679; PAP-00245843, PAP-00259186)

Area C

Area C is a paved area and was used to store empty drums of facility process-related materials. Two soil borings were completed within one foot of previous borings C-2 and

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C3 to a depth of three feet. No evidence of contamination (i.e., staining or odor) was observed in either boring. Samples were collected from 1.5 to 2 ft bgs and analyzed for volatile organic compounds (VOCs) and priority pollutant metals. Mercury was detected at a maximum concentration of 0.56 mg/kg in sample C-3A at a depth of 1.5-2 ft bgs (PAP-00244652).

Area I2

This area is an exterior area to the west of the drawing fluid pit and the basement area of Building 25 in which above ground drawing fluid tanks were located. Soil borings I2-1 through I2-3 were completed outside the building to the water table at distances of approximately 20 ft to the north, west, and south of I-2 in an effort to determine the source of conditions encountered in the previous boring. A fourth boring, I2-4 was completed to the east of I-2 inside the building in the hole in the basement floor. No evidence of contamination was observed in any of the exterior borings until the water table, which was encountered at a depth of approximately 10 ft bgs. Soil at the water table was oil stained and had an odor of weathered oil. Evidence of contamination in the form of oil staining and odor was observed throughout I2-4. A sample for laboratory analysis was collected within six inches of the water table and analyzed for VOCs, copper, mercury, and lead, with the exception of I2-4, which was not analyzed for mercury and lead (PAP-00244664). Mercury was detected at a maximum concentration of 0.8 mg/kg from sample I2-1B at a depth of 9.09.5 ft bgs (PAP-00244667).

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area. Approximately 200 cubic yards of soil was removed. A total of 15 post-removal soil samples were collected following the first excavation on January 23, 1993. The soils removed during the first soil event consisted entirely of ash and cinder fill. The fill in this area contained parts of plumbing fixtures, glass vials, metals lids, etc. Okonite concluded that, due to the analytical results of the first round of post-removal samples, a second soil removal event was required. Subsequently, an additional 100 cubic yards were removed and post-removal sampling was conducted on December 7, 1990. Following the second excavation, 11 post-removal soil samples were collected from the excavation base and the base of the sidewalls. These samples were analyzed for TPH, BNs, lead, zinc, mercury, copper, and PCBs (PAP-00244676). The maximum detected concentration of mercury in this area during the second soil sampling event was 430 mg/kg collected from sample K-24 at a depth of 7-7.5 ft bgs (PAP-00244679). Mercury was remediated at Area K to the satisfaction of the NJDEP (PAP-00240079, 81).

Area M

Mercury was not detected in the soil samples collected from Area M (PAP-00244684).

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Drainage Structures

Soil borings were advanced and samples were collected from the drainage structures. Maximum detected mercury concentrations are presented in the following table:

Max Mercury Concentrations detected at Drainage Structures (mg/kg)			
Drain #	Sample	Depth	Concentration
13	DR-3	0-6"	1.4
18	DRX-1	6-6.5 ft	11
19	DRX-2	6-6.5 ft	40
20	DR-1	30-36"	24
30	30	2-2.5 ft	0.9
53	DR53	0.5 ft	0.06 J
54	DR54	2.5-3 ft	12

(PAP-00245837, 41, 43, 45, 47, 49)

The highest mercury concentration was located in a post-removal sample at Drain 19. Soil had been removed in the vicinity of the Drains 18-20 to a depth of 5 ft bgs. The removed soil was sample and classified as non-hazardous but was disposed in bulk with other waste as hazardous waste D008 (PAP-00245795-6).

No sediments are present at the site; however, Weasel Brook forms the western boundary of the site. Okonite collected 13 sediment samples from Weasel Brook in July 1992. The samples were analyzed for metals, VOCs, base neutrals, and total organic carbon. Sample locations were biased towards the areas where outfall pipes discharged to Weasel Brook. Samples of stream bank and/or bottom sediments were collected where available, beneath three of the facility outfall pipes , at the furthest upstream end of the brook on the site (PAP-00243477), and at a location downstream of the facility outfall pipes. A sample was not collected at the upstream end of the brook at the property because the brook enters the property boundary in a covered culvert. The bottom of the brook was concrete and stone where it exited the culvert and no sediment was present for sampling. According to the RAR, dated December 17, 2003, mercury was detected at a maximum concentration of 18 mg/kg from sample SS-4 at a depth of 0-6 inches (PAP-00259186). A significant amount of time had passed since Okonite's industrial discharges to the brook ceased. Normal processes of erosion and deposition have likely made sediment conditions at that time non-representative of any impacts Okonite's operations may have had (PAP-0024378). In addition, during the May 2004 sampling event, waste automotive parts were observed in Weasel Brook, and had been dumped from the bank opposite of Okonite (PAP-00258638).

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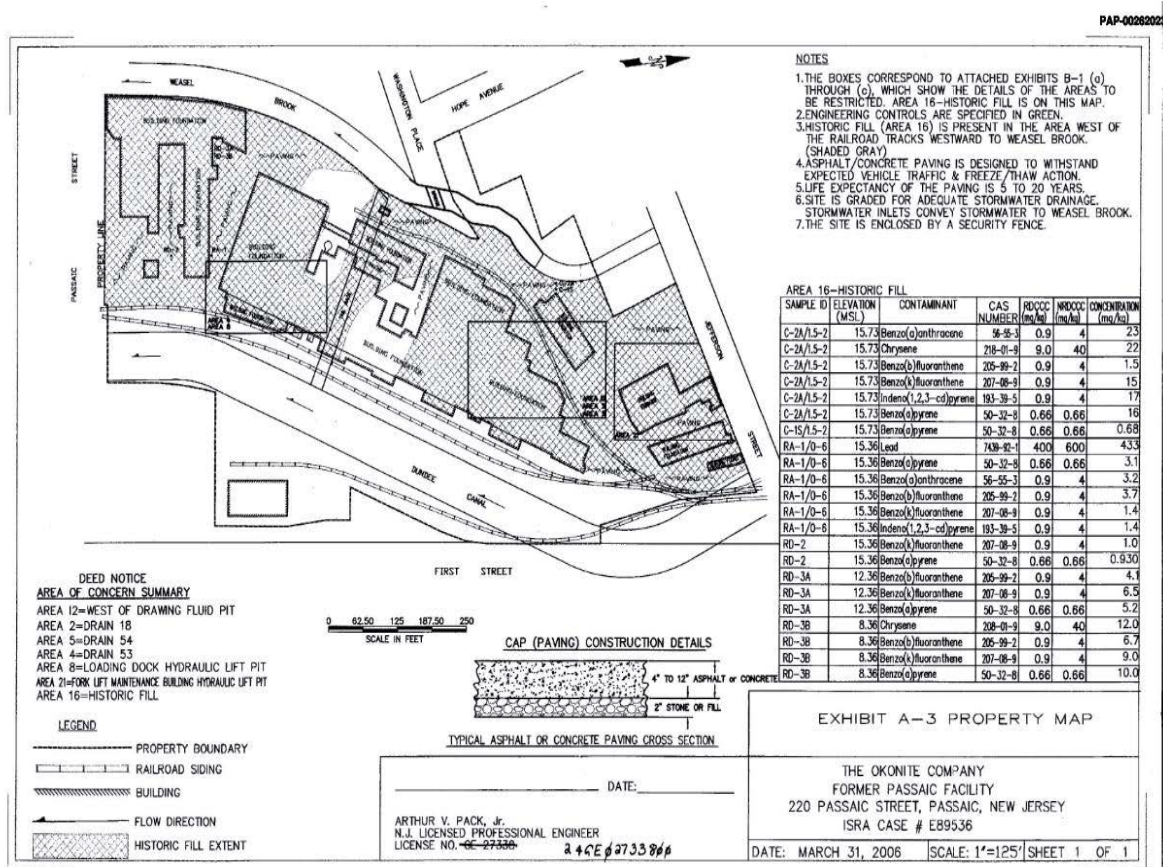
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Historic Fill

The Allocation Team has not determined whether the site is located on regional Historic Fill as designated by the NJDEP.¹

However, historical documents including a historical site plan establishes historic fill on two thirds of the property based on soil investigations conducted at the Site (PAP-00264490). Of the AOCs identified at the Site, Historic Fill was identified as Area 16 (PAP-00260097). The AOCs discussed above are generally collocated with historic fill material (including ash and cinder), as determined by extensive subsurface investigations at the Site. The following figure depicts the extent of historic fill material encountered at the Site:



(PAP-00262023)

¹Digital Geodata Series, DGS04-7, Historic Fill for New Jersey, <https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm>, Quadrangle #52 & #53 (NJDEP map identifying locations of recognized historic fill).

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The New Jersey Department of Environmental Protection (NJDEP) has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.² Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.³ PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.⁴

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00244645-67).

COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	110,000 mg/kg
Copper	12,000 mg/kg
Mercury	430 mg/kg
Benzo(a)anthracene	23 mg/kg
Benzo(a)pyrene	24 mg/kg
Benzo(b)fluoranthene	17 mg/kg
Benzo(k)fluoranthene	27 mg/kg
Dibenzo(a,h)anthracene	0.14J mg/kg
Indeno(1,2,3-cd)pyrene	17 mg/kg

J: estimated

5. COC Pathways

Storm Sewer

There were 22 discharge outfalls from the facility to Weasel Brook. The discharge consisted of contact cooling water, non-contact cooling water, and storm water run-off (PAP-00242102, 48-49).

² *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1998), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

³ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

⁴ NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

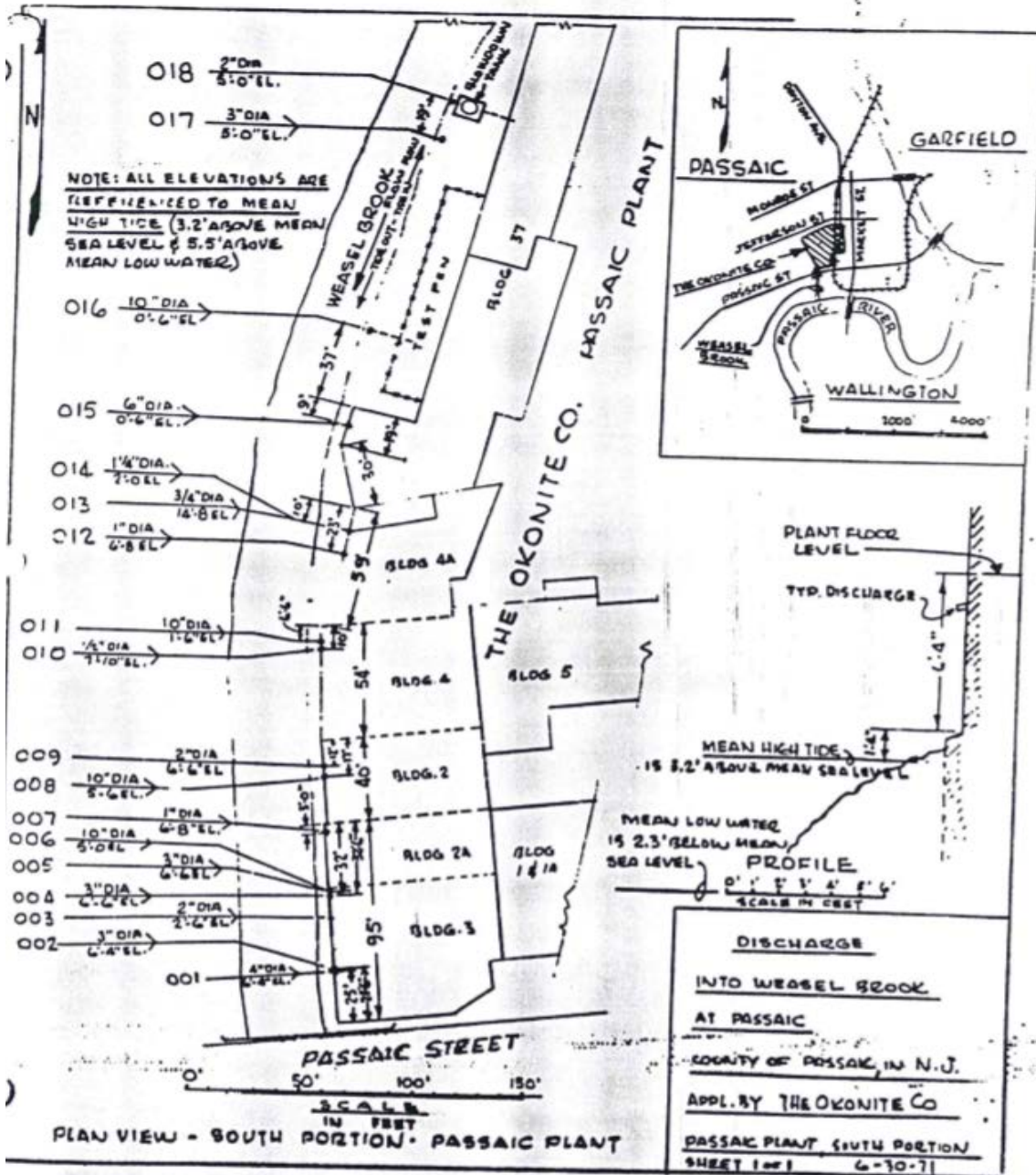
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According to an Application for Permit to Discharge Wastewaters dated March 28, 1988 Outfalls 006, 008, 011, 016, 019, 020, and 022 had an average flow of 50,000 GPD of stormwater discharge into Weasel Brook (PAP-00263525-28).

The same application reported Outfalls 001, 002 004, 005, 006, 008, 011, 015, and 021 were outfalls for contact cooling water, non-contact seal water, and steam condensate. The average flow of contact cooling water at the facility ranged from 6200 GPD to 12500 GPD (PAP-00263525-28).

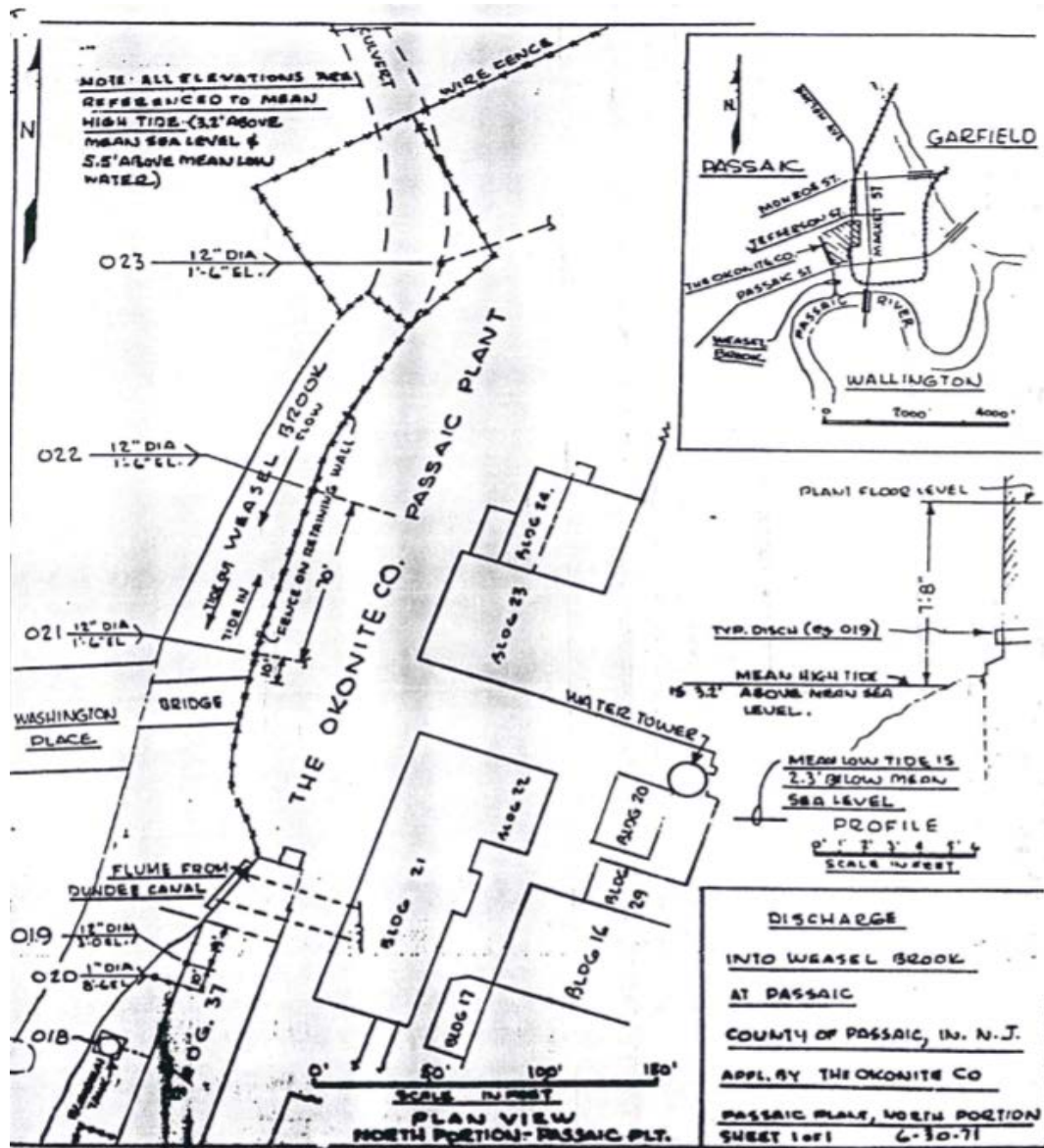


(PAP-00263524)

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(PAP-00263523)

Direct Discharge

According to a 2005 PRP Data Extraction Form for the Lower Passaic River Study Area, PVSC reported on the discharge of "polluting" boiler blowdown from the Okonite facility in 1973. PVSC did not indicate if the facility boiler blowdown outlet was discharged to the river or sewer. The company was directed to halt the pollution and discharge the boiler blowdown to the sanitary sewer. The 1973 PVSC Annual report noted that Mr. Strandberg, Plant Manager, replied that they had studied the situation and that it was feasible to install a boiler blowdown tank, with a discharge into the sanitary sewer. He further stated that this could only be done when the boilers were shut down, and they intended to do this during their summer shutdown in 1974. Since the pollution was not

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great, the PVSC believed this to be reasonable. (PAS-00034781; PAS-00102011). PVSC documentation stated the polluting discharge continued from November 1973 through August 1974 (PAS-00123419). Note: The 1973 PVSC Annual Report did not specify COCs analyzed and there is no indication that any of the eight specific COCs at issue herein formed a part of the boiler blowdown discussed.

Okonite discharged wastewater to Weasel Brook via several outfall pipes, as permitted by NJPDES Permit No. NJ0002615. As documented in a Priority Pollutants Monitoring Report, dated December 6, 1977, copper was found at a concentration of 27 J µg/L in the raw influent water. Effluent samples from water discharged from Site operations during that same sampling event exhibited lower concentrations of copper, at 12 J and 15 J µg/L. Similarly, lead was found at a concentration of 2,200 J micrograms per liter (µg/L) in the raw influent water originating from the PVWC. Effluent samples from water discharged from Site operations during that same sampling event exhibited lower concentrations of lead, at 49 J and 700 J µg/L, indicating that the manufacturing process did not introduce a measurable quantity of copper or lead to the waste stream. (PAP-00264228, 55).

According to a 2005 PRP Data Extraction Form for the Lower Passaic River Study Area, sediment samples collected from Weasel Brook in July 1992 identified copper, lead, and mercury contamination. The samples were collected in the area of facility outfall pipes to Weasel Brook (Passaic River tributary), in the area of the stream bank, in sediments beneath three of the outfall pipes, at the furthest upstream end of the brook on the site (PAP-00243477), and at a location downstream of the outfall pipes (PAS-00123419). The most downstream sample location (SS-8, located adjacent to the former facilities southwest corner) had a copper concentration of 48 mg/kg. However, the most upstream sample (SS-3) had a copper concentration of 57 mg/kg.

Copper was detected at a maximum concentration of 430 mg/kg at sample location SS-4 (adjacent to the bank of the river in an area of historic fill) (PAP-00243535). Lead was detected in two bank samples (PAP-00243478). Lead was detected at a maximum concentration of 8,200 mg/kg at sample location SS-2 (on the bank of the river in an area of historic fill) (PAP-00259186). Industrial discharges from a number of outfall pipes directly across the brook from the Okonite facility were noted (PAP-00243478). Mercury was detected at a maximum concentration of 18 mg/kg at sample location SS-4 (adjacent to the bank of the river in an area of historic fill). All the maximum detected concentrations of copper, lead, and mercury were collected at a depth of 0-6 inches bgs (PAP-00259185-91). A figure showing the sediment sampling locations is available in Figure 6 of the October 1992 *Results of Supplemental Sampling Plan Implementation* (PAP-00243554). A significant amount of time had passed since Okonite's industrial discharges to the brook ceased. Normal processes of erosion and deposition have likely made sediment conditions at that time non-representative of any impacts Okonite's operations may have had (PAP-00243478). In addition, during a May 2004 sampling event, waste automotive parts were observed in Weasel Brook, and had been dumped from the bank opposite of Okonite (PAP-00258638).

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Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Permits

According to 2005 *PRP Data Extraction Form for the Lower Passaic River Study Area*, Okonite discharged facility wastewater to Weasel Brook via several outfall pipes and held NPDES Permit NJ0002615 (PAS-00123418).

Okonite discharged stormwater, contact, and non-contact cooling waters to Weasel Brook. Prior to issuance, a draft permit application to discharge was released for public comment; no objections to Okonite's proposed discharges to Weasel Brook were raised, and the original NJPDES permit #NJ0002615 was issued. Permit #NJ0002615 was approved to discharge to Weasel Brook from a total of 22 discharges (PAP-00244709-719):

The NJPDES permits from 1974 to 1983 required Okonite to monitor the discharges and submit Discharge Monitoring Reports quarterly. Specific analytical parameters were required by the facility, including: flow, pH, and temperature. From 1983 to 1993, the permits added monitoring of petroleum hydrocarbons, chemical oxygen demand, total suspended solids, and total copper (PAP-00242145-56).

The monitoring results from March 21, 1989 NJPDES permit application contained copper ranging from less than 0.03 milligrams per liter (mg/L) to 0.64 mg/L, which was below the permitted limit of 1 mg/L (PAP-00242145-56).

Violation

As reported by the 1973 *Passaic Valley Sewerage Commissioners Annual Report*, while reviewing the Okonite outlet permit application, Mr. Lubetkin noted that outlet #018 was a boiler blowdown outlet. Since, generally speaking, boiler blowdown is polluting, and since it was easy to correct where a sanitary sewer was available (install a blowdown tank and discharge it to the sewer), Mr. Lubetkin requested that the Inspection Department check this and get a sample. A sample was obtained, found polluting, and the company was directed by the Inspector to halt this pollution. This order was confirmed in a letter to the Okonite Company by Mr. Lubetkin dated December 13, 1973 (PAS-00034781; PAS-00102011). Note: The 1973 PVSC Annual Report did not specify COCs analyzed and there is no indication that any of the eight specific COCs at issue herein formed a part of the boiler blowdown discussed.

In addition, the 1973 *PVSC Annual Report* noted that Mr. Strandberg, Plant Manager, replied that they had studied the situation and that it was feasible to install a boiler blowdown tank, with a discharge into the sanitary sewer. He further stated that this could only be done when the boilers were shut down, and they intended to do this during

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their summer shutdown in 1974. Since the pollution was not great, the PVSC believed this to be reasonable (PAS-00034781; PAS-00102011).

On August 27, 1985 NJDEP issued Okonite an Administrative Order concerning a violation of the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq and regulations promulgated thereunder, specifically N.J.A.C 7:26-7.6(f) 2 for failure to file an annual report (PAS-00102064-5). This violation was not related to any discharges from the site (PAS-00102066-8).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Results of Sampling Plan Implementation and Supplemental At-Peril Activities*, the Okonite Company, Canal and Jefferson Streets Facility, Passaic, New Jersey Facility, ECRA Case Number 89536, dated February 1991 (PAP-00244621).
- *Results of Supplemental Sampling Plan Implementation and Additional At-Peril Activities*, The Okonite Company, ECRA Case #89536, dated October 1992 (PAP-00245760).
- *Remedial Action Report*, The Okonite Company, Former Passaic Plant, ISRA Case # 89536, dated December 17, 2003 (PAP-00259153).

Sewer

There is no information regarding sewer sampling in the available file material.

Mercury

Of the Site AOCs, mercury has only been identified in soil samples at the following AOCs (Area C, Area I2, and Area K).

Area C

Area C is a paved area and was used to store empty drums of facility process-related materials. Two soil borings were completed within one foot of previous borings C-2 and C3 to a depth of three feet. No evidence of contamination (i.e., staining or odor) was observed in either boring. Samples were collected from 1.5 to 2 ft bgs and analyzed for volatile organic compounds (VOCs), base neutral compounds (BNs), and priority pollutant metals. Mercury was detected at a maximum concentration of 0.56 mg/kg in sample C-3A at a depth of 1.5-2 ft bgs (PAP-00244652).

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Area I2

This area is an exterior area to the west of the drawing fluid pit and the basement area of Building 25 in which above ground drawing fluid tanks were located. Soil borings I2-1 through I2-3 were completed outside the building to the water table at distances of approximately 20 ft to the north, west, and south of I-2 in an effort to determine the source of conditions encountered in the previous boring. A fourth boring, I2-4 was completed to the east of I-2 inside the building in the hole in the basement floor. No evidence of contamination was observed in any of the exterior borings until the water table, which was encountered at a depth of approximately 10 ft bgs. Soil at the water table was oil stained and had an odor of weathered oil. Evidence of contamination in the form of oil staining and odor was observed throughout I2-4. A sample for laboratory analysis was collected within six inches of the water table and analyzed for VOCs, copper, mercury, and lead, with the exception of I2-4, which was not analyzed for mercury and lead (PAP-00244664). Mercury was detected at a maximum concentration of 0.8 mg/kg from sample I2-B at a depth of 9.0-9.5-ft bgs (PAP-00244667).

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area. Approximately 200 cubic yards of soil was removed. A total of 15 post-removal soil samples were collected following the first excavation on January 23, 1993... The soils removed during the first soil event consisted entirely of ash and cinder fill. The fill in this area contained parts of plumbing fixtures, glass vials, metals lids, and other similar materials. Okonite concluded that, due to the analytical results of the first round of post-removal samples, a second soil removal event was required. Subsequently, additional 100 cubic yards were removed and post-removal sampling was conducted on December 7, 1990. Following the second excavation, 11 post-removal soil samples were collected from the excavation base and the base of the sidewalls. These samples were analyzed for TPH, BNs, lead, zinc, mercury, copper, and PCBs (PAP-0024462176). The maximum detected concentration of mercury in this area during the second soil sampling event was 430 mg/kg collected from sample K-24 at a depth of 7-7.5 ft bgs (PAP-00244679).

Drainage Structures

In addition to drains 13, 18-20, 30, 53, and 54, and the Weasel Brook discharge points, three areas of potential environmental concern were identified in the course of decontamination and decommissioning activities. These were the stream bank adjacent to Building 37, where lead strips were found; the baghouse area, an unpaved area beneath the Banbury mixer where oil-stained soils were observed; and the hydraulic lift pit, the location of lift equipment for the loading dock, where oil-stained soils were also found (PAP-00245798-802).

No sediments are present at the site; however, Weasel Brook forms the western boundary of the site. Okonite collected 13 sediment samples from Weasel Brook in July 1992. The samples were analyzed for metals, VOCs, base neutrals, and total organic

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carbon. Sample locations were biased towards the areas where outfall pipes discharged to Weasel Brook. Samples of stream bank and/or bottom sediments were collected where available, beneath three of the facility outfall pipes, at the furthest upstream end of the brook on the site (PAP-00243477), and at a location downstream of the facility outfall pipes. A sample was not collected at the upstream end of the brook at the property boundary because the brook enters the property in a covered culvert. The bottom of the brook was concrete and stone where it exited the culvert and no sediment was present for sampling. According to the RAR, dated December 17, 2003, mercury was detected at a maximum concentration of 18 mg/kg from sample SS-4 at a depth of 0-6 inches (PAP-00259186). A significant amount of time had passed since Okonite's industrial discharges to the brook ceased. Normal processes of erosion and deposition have likely made sediment conditions at that time non-representative of any impacts Okonite's operations may have had (PAP-00243478). In addition, during the May 2004 sampling event, waste automotive parts were observed in Weasel Brook, and had been dumped from the bank opposite of Okonite (PAP-00258638).

Copper

Based on review of the RAR, dated December 17, 2003, copper was detected only at the following AOCs:

Area C

Area C is a paved area and was used to store empty drums of facility process-related materials. Two soil borings were completed within one foot of previous borings C-2 and C3 to a depth of three feet. No evidence of contamination (i.e., staining or odor) was observed in either boring. Samples were collected from 1.5 to 2 ft bgs and analyzed for volatile organic compounds (VOCs) and priority pollutant metals. Copper was detected at a maximum concentration of 95 mg/kg in sample C-3A at a depth of 1.5-2 ft bgs (PAP-00244652).

Area I1

This area is the location of a 9000-gallon concrete pit that was used to store drawing fluid for copper wire. The pit was installed in approximately 1976 and was approximately 9.5 ft bgs. Soil borings were completed on all four sides of the pit. Soil borings could not be completed adjacent to the pit on the north and west sides due to numerous subsurface obstructions such as metal plates, subsurface concrete slabs, etc., that were historically located in this area. A total of nine borings were installed. No evidence of contamination was encountered above the water table in any of the soil borings. Two samples for laboratory analyses were collected from each boring from the six-inch interval above the water table (8 to 8.5-9 ft bgs) and from a six-inch interval at the bottom of the pit (9.5-10 ft. bgs). All samples were analyzed for VOC and copper. Copper was detected at a maximum concentration of 1900 mg/kg from sample I1-2B at a depth of 8-8.5 ft bgs (PAP-00244662). NJDEP approved NFA for Area I1 in 1994 (PAP-00240168-70).

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In their comment letter dated April 11, 1994, NJDEP noted that the concentration of 1,900 mg/kg copper did not meet the then-applicable RDCSCC. Although elevated metal concentrations were detected in downgradient wells in one round of samples, the concentrations were attributed to incomplete field filtering and not to dissolved metals. As the soil sample was collected at 8 feet below grade and beneath the building, it did not require remediation. NJDEP approved NFA for Area I1 in 1994 (PAP-00240168-70).

Area I2

This area is an exterior area to the west of the drawing fluid pit and the basement area of Building 25 in which above ground drawing fluid tanks were located. Soil borings I2-1 through I2-3 were completed outside the building to the water table at distances of approximately 20 ft to the north, west, and south of I-2 in an effort to determine the source of conditions encountered in the previous boring. A fourth boring, I2-4 was completed to the east of I-2 inside the building in the hole in the basement floor. No evidence of contamination was observed in any of the exterior borings until the water table, which was encountered at a depth of approximately 10 ft bgs. Soil at the water table was oil stained and had an odor of weathered oil. Evidence of contamination in the form of oil staining and odor was observed throughout I2-4. A sample for laboratory analysis was collected within six inches of the water table and analyzed for VOCs, copper, mercury, and lead, with the exception of I2-4, which was not analyzed for mercury and lead (PAP-00244664). Copper was not in soil samples collected from this area (PAP-00244664).

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area. Approximately 200 cubic yards of soil was removed. A total of 15 post-removal soil samples were collected following the first excavation on January 23, 1993. Samples were analyzed for TPH, VOCs, BNs, lead, and zinc. The soils removed during the first soil event consisted entirely of ash and cinder fill. The fill in this area contained parts of plumbing fixtures, glass vials, metals lids, etc. Okonite concluded that, due to the analytical results of the first round of post-removal samples, a second soil removal event was required. Subsequently, an additional 100 cubic yards were removed and post-removal sampling was conducted on December 7, 1990. Following the second excavation, 11 post-removal soil samples were collected from the excavation base and the base of the sidewalls and analyzed for TPH, BNs, lead, zinc, mercury, copper, and PCBs (PAP-00244676). The maximum detected concentration of copper in this area during the second soil sampling event was 260 mg/kg collected from sample K-25 at a depth of 7.5-8 ft bgs (PAP-00244679). The NJDEP approved NFA for Area K in their comment letter dated January 20, 1995 (PAP-00240081).

Area M

This area was identified as an area of potential environmental concern during on-going facility decontamination/decommissioning activities when the banbury mixer (rubber compounding machine) was removed. The area is approximately 20 by 10 feet in size

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and, the bottom of the pit is approximately 3 feet below grade, and consisted of several concrete sub-chambers. The sub-chambers were mostly filled with soil and sediment but also contained minor amounts of rubber compounding waste. Removal of the fill material revealed that the floors and walls of the sub-chambers are not continuous throughout the structure (i.e., gaps are present). The fill material that was removed prior to the submittal of the February 1992 *Results of Sampling Plan Implementation and Supplemental At-Peril Activities* report (approximately 15 cubic yards) was staged beside the pit. A waste classification sample was collected from this material. Copper was not detected in the soil samples collected from Area M (PAP-00244684).

Drainage Structures

No sediments are present at the site; however, Weasel Brook forms the western boundary of the site. As mentioned above, Okonite discharged wastewater to Weasel Brook via several outfall pipes, as permitted by NJPDES Permit No. NJ0002615. As documented in a Priority Pollutants Monitoring Report, dated December 6, 1977, copper was found at a concentration of 27 J micrograms per liter ($\mu\text{g/L}$) in the raw influent water. Effluent samples from water discharged from Site operations during that same sampling event exhibited lower concentrations of copper, at 12 and 15 $\mu\text{g/L}$, indicating that the manufacturing process did not introduce a measurable quantity of copper to the waste stream (PAP-00264228, 55). Okonite collected 13 sediment samples from Weasel Brook in July 1992. The samples were analyzed for metals, VOCs, base neutrals, and total organic carbon. Sample locations were biased towards the areas where outfall pipes discharged to Weasel Brook. Samples of stream bank and/or bottom sediments were collected where available, beneath three of the facility outfall pipes, at the furthest upstream end of the brook on the site (PAP-00243477), and at a location downstream of the facility outfall pipes. A sample was not collected at the upstream end of the brook at the property because the brook enters the property boundary in a covered culvert. The bottom of the brook was concrete and stone where it exited the culvert and no sediment was present for sampling. The most downstream sample location (SS-8, located adjacent to the former facilities southwest corner) had a copper concentration of 48 mg/kg. However, the most upstream sample (SS-3) had a copper concentration of 57 mg/kg. According to the RAR, dated December 17, 2003, copper was detected at a maximum concentration of 430 mg/kg from sample SS-4 at a depth of 0-6 inches (PAP-00259186). A significant amount of time had passed since Okonite's industrial discharges to the brook ceased. Normal processes of erosion and deposition have likely made sediment conditions at that time non-representative of any impacts Okonite's operations may have had (PAP-00243478).

In addition, during a May 2004 sampling event, waste automotive parts were observed in Weasel Brook, and had been dumped from the bank opposite of Okonite (PAP-00258638).

Lead

Based on review of the RAR, dated December 17, 2003, lead was detected only at the following AOCs:

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Area C

Area C is a paved area and was used to store empty drums of facility process-related materials. Two soil borings were completed within one foot of previous borings C-2 and C3 to a depth of three feet. No evidence of contamination (i.e., staining or odor) was observed in either boring. Samples were collected from 1.5 to 2 ft bgs and analyzed for volatile organic compounds (VOCs) and priority pollutant metals. Lead was detected at a maximum concentration of 270 mg/kg in sample C-3A at a depth of 1.5-2 ft bgs (PAP-00244652).

Area G

Area G is the location of a former gasoline 8,000-gallon UST. In addition, a small, approximately 1,000-gallon, abandoned UST that contained sand and a small amount of water, was discovered immediately adjacent to the gasoline UST during removal of the gasoline UST. Both USTs were properly closed (PAP-00244657-58). Following removal of the two USTs, field observations and monitoring instrument responses showed that a small amount of contaminated soil remained in place at the west end of the excavation. Analytical results showed that lead was detected at a concentration of 370 mg/kg from sample G-3 at a depth of 6.5-7 ft bgs (PAP-00244659). The NJDEP approved NFA for Area G in their letter dated April 11, 1994 (PAP-00240168-70).

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area. Approximately 200 cubic yards of soil was removed. A total of 15 post-removal soil samples were collected following the first excavation on January 23, 1993. Samples were analyzed for TPH, VOCs, BNs, lead, and zinc. The soils removed during the first soil event consisted entirely of ash and cinder fill. The fill in this area contained parts of plumbing fixtures, glass vials, metals lids, etc. Okonite concluded that, due to the analytical results of the first round of post-removal samples, a second soil removal event was required. Subsequently, an additional 100 cubic yards were removed and post-removal sampling was conducted on December 7, 1990. Following the second excavation, 11 post-removal soil samples were collected from the excavation base and the base of the sidewalls and analyzed for TPH, BNs, lead, zinc, mercury, copper, and PCBs (PAP-00244676). The maximum detected concentration of lead in this area during the second soil sampling event was 2700 mg/kg collected from sample K-23 at a depth of 7-7.5 ft bgs (PAP-00244679). The remediation was completed to the satisfaction of the NJDEP and a No Further Action Letter was issued on January 20, 1995 (PAP-00240081).

Area M

This area was identified as an area of potential environmental concern during on-going facility decontamination/decommissioning activities when the Banbury mixer (rubber compounding machine) was removed. The area is approximately 20 by 10 feet in size and, the bottom of the pit is approximately 3 feet below grade, and consisted of several

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concrete sub-chambers. The sub-chambers were mostly filled with soil and sediment but also contained minor amounts of rubber compounding waste. Removal of the fill material revealed that the floors and walls of the sub-chambers are not continuous throughout the structure (i.e., gaps are present). The fill material that was removed prior to the submittal of the February 1992 *Results of Sampling Plan Implementation and Supplemental At-Peril Activities* report (approximately 15 cubic yards) was staged beside the pit. A waste classification sample was collected from this material. Copper was not detected in the soil samples collected from Area M (PAP-00244679).

Drainage Structures and Machinery Pits

No sediments are present at the site; however, Weasel Brook forms the western boundary of the site. As mentioned above, Okonite discharged wastewater to Weasel Brook via several outfall pipes, as permitted by NJPDES Permit No. NJ0002615. As documented in a Priority Pollutants Monitoring Report, dated December 6, 1977, lead was found at a concentration of 2,200 J µg/L in the raw influent water originating from the PVWC. Effluent samples from water discharged from Site operations during that same sampling event exhibited lower concentrations of lead, at 49 J and 700 J µg/L, indicating that the manufacturing process did not introduce a measurable quantity of copper or lead to the waste stream (PAP-00264228, 55). Okonite collected 13 sediment samples from Weasel Brook in July 1992. The samples were analyzed for metals, VOCs, base neutrals, and total organic carbon. Sample locations were biased towards the areas where outfall pipes discharged to Weasel Brook. Samples of stream bank and/or bottom sediments were collected where available, beneath three of the facility outfall pipes, at the furthest upstream end of the brook on the site (PAP-00243477), and at a location downstream of the facility outfall pipes. A sample was not collected at the upstream end of the brook at the property because the brook enters the property in a covered culvert. The bottom of the brook was concrete and stone where it exited the culvert and no sediment was present for sampling. Lead was detected in two bank samples. According to the RAR, dated December 17, 2003, lead was detected at a maximum concentration of 8200 mg/kg from sample SS-2 at a depth of 0-6 inches (PAP-00259186). A significant amount of time had passed since Okonite's industrial discharges to the brook ceased. Normal processes of erosion and deposition have likely made sediment conditions at that time non-representative of any impacts Okonite's operations may have had (PAP-00243478) In addition, there was evidence of others dumping into this section of the river as evidenced by observations of industrial discharges from a number of outfall pipes directly across the brook from Okonite (PAP-00243478), and waste automotive parts that had been dumped from the bank of Weasel Brook opposite of Okonite (PAP-00258638).

PAHs

The International Carbon Black Association states that PAHs can only be extracted from the surface of industrially-manufactured Carbon Black under vigorous laboratory conditions, and that the risks to human health associated with presence of PAHs originating from carbon black in its final product form is extremely low (PAP-00264260-1). Based on review of the RAR, dated December 2003; PAHs were detected in soil

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samples collected from the various AOCs. Presented below are the PAH concentrations at the various AOCs:

Area A, B1, and D

Soil sampling conducted at Areas A and B1 in 1990 showed carcinogenic polycyclic aromatic hydrocarbons (cPAHs) were below 10 milligrams per kilogram (mg/kg) (PAP-00244643-44).

The following PAHs; phenanthrene, fluoranthene, and pyrene were detected at concentrations of 0.027 mg/kg, 0.061 mg/kg, and 0.095 mg/kg collected from sample A-1 at a depth of 2.5-3.0 feet below ground surface (ft bgs) (PAP-00244645).

The following PAHs; phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, and benzo(a)pyrene were detected at concentrations of 0.54 mg/kg, 0.66 mg/kg, 1.1 mg/kg, 0.45 mg/kg, and 0.23 mg/kg from sample B-2B at a depth of 1-1.5 ft bgs (PAP-00244646).

No PAHs were detected in soil samples collected from Area D (PAP-00244647).

Historical soil sampling data for these Areas A, B1 and D complied with applicable RDCSCC. The NJDEP approved NFA in their letter dated April 11, 1994 (PAP-00240168-70).

Area B2

Soil sampling conducted in 1990 at Area B2 indicated concentrations of PAHs to be below 10 mg/kg. The following PAHs; phenanthrene, fluoranthene, pyrene, benzo(a)anthracene were detected at maximum concentrations of 0.84 mg/kg, 1.7 mg/kg, 1.9 mg/kg, 1 mg/kg (from sample B2-4 at a depth of 4.5-5 ft bgs) and benzo(b)fluoranthene and benzo(k)fluoranthene were detected at estimated concentrations of 0.25 mg/kg and 0.2 mg/kg (from sample B2-2 at a depth of 4.5-5 ft bgs) (PAP-00244648-49). The soil was disposed at the American Landfill in Youngstown, Ohio and the excavation was backfilled with offsite fill after laboratory results revealed that contamination had been removed (PAP-00244650). The NJDEP approved NFA for Area B2 in their letter dated April 11, 1994 (PAP-0024016870).

Area C

Area C is a paved area and was used to store empty drums of facility process-related materials. Two soil borings were completed within one foot of previous borings C-2 and C3 to a depth of three feet. No evidence of contamination (i.e., staining or odor) was observed in either boring. Samples were collected from 1.5 to 2 ft bgs and analyzed for volatile organic compounds (VOCs) and priority pollutant metals.

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Sample C-2A/1.5-2 was later determined to be non-representative, based on the presence of ash and cinder fill material in the sample (PAP-00245778). The NJDEP approved conditional NFA for Area C "if Okonite applies appropriate institutional and/or engineering controls" (PAP-00240168, 70).

Area E

This area was the location of an abandoned approximately 300-gallon steel UST encased in concrete that was historically used to store waste kerosene and other compounds that may have been used as degreasers at the facility. The UST was properly decommissioned through removal in accordance with facility Decontamination/Decommissioning Plan. The UST was disposed as scrap metal along with the USTs from Area G. No evidence of a release was found in the removal of the USTs. Soil sampling results upon UST removal indicated concentrations of phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, and benzo(a)pyrene to be 0.57 mg/kg, 0.065 mg/kg, 0.74 mg/kg, 0.73 mg/kg, 0.36 mg/kg, and 0.3 mg/kg (from sample E-4 collected at a depth of 5.5 ft bgs) (PAP-00244654). Based on the post-removal analytical results, the NJDEP approved NFA for Area E in their letter dated April 11, 1994 (PAP-00240168-70).

Area F1

This area is the location of a 76,000-gallon concrete UST that was used to store No. 6 fuel oil. The UST was installed in approximately 1922. The UST has been emptied and cleaned. Soil borings F-7 through F-9 were completed to the northwest, north, east, and west (immediately downgradient) of the UST respectively. These borings were completed within ten feet of the UST and to depths of 11 ft. Oil staining and odor were observed in all four borings from depths starting from 7 to 10 ft bgs. Samples for laboratory analyses were collected from 10 to 10.5 ft bgs.

Subsequent to the original sampling, a duplicate sample was collected to evaluate the previous PAH detections at Area F1, identified as sample F-10A/10.5-11. No PAHs were detected in this sample (PAP-00245794).

Multiple soil excavations were conducted at Area F1 in 2002, as well as in 2007 following the demolition of former Building 37 (PAP-00259691-750; PAP-00264067-227).

Area F2

This area consists of a piping trench located beneath a metal plate in the floor of the facility engine room, which houses the facility air compressors. This area was identified as an area of potential concern subsequent to conditional sampling plan approval during implementation of decontamination/decommissioning activities for machinery pits and other subgrade structures at the facility. Condensate from the air compressors was determined to have been historically discharged to the trench, which was earthen-bottomed. One soil boring was completed within the trench to the depth of the water table. Two samples were collected from this boring from the first six-inch interval of soil

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within the trench and from the six-inch interval above that apparently affected by normal fluctuations of the water table. PAHs were not detected at Area F2 (PAP-00244657).

The NJDEP conditionally approved NFA for Area F2 (also identified as AOC 10), provided an institutional control be established (PAP-00240084). The institutional control was required for previous detections of Total Petroleum Hydrocarbons, and not specific to PAHs in this AOC.

Area G

Area G is the location of a former gasoline 8,000-gallon UST. In addition, a small, approximately 1,000-gallon, abandoned UST that contained sand and a small amount of water, was discovered immediately adjacent to the gasoline UST during removal of the gasoline UST. Both USTs were properly closed. No PAHs were detected at Area G (PAP-00244659-70). The NJDEP approved NFA for Area G in their letter dated April 11, 1994 (PAP-00240168-70).

Area I1

This area is the location of a 9,000-gallon concrete pit that was used to store drawing fluid for copper wire. The pit was installed in approximately 1976 years ago. No evidence of contamination was encountered above the water table. Two samples for laboratory analyses were collected from each boring from the six-inch interval above that apparently affected by normal fluctuations of the water table (8 to 8.5 or 8.5 to 9 ft) and from the six-inch interval at the bottom of the pit (9.5 to 10 ft). Soil samples collected during a 1990 soil sampling event indicated maximum detections of the following PAHs: phenanthrene (0.048 mg/kg), fluoranthene (0.037 mg/kg), and pyrene (0.042 mg/kg) collected from sample I1-3 at a depth of 8.5-9 ft bgs (PAP-00244661-62). NJDEP approved NFA for Area I1 in 1994 (PAP-00240168-70).

Area I2

This area is an exterior area to the west of the drawing fluid pit and the basement area of Building 25 in which above ground drawing fluid tanks were located. Soil borings I2-1 through I2-3 were completed outside the building to the water table at distances of approximately 20 ft to the north, west, and south of I-2 in an effort to determine the source of conditions encountered in the previous boring. A fourth boring, I2-4 was completed to the east of I-2 inside the building in the hole in the basement floor. No evidence of contamination was observed in any of the exterior borings until the water table, which was encountered at a depth of approximately 10 ft bgs. Soil at the water table was oil stained and had an odor of weathered oil. Evidence of contamination in the form of oil staining and odor was observed throughout I2-4. A sample for laboratory analysis was collected within six inches of the water table and analyzed for VOCs, copper, mercury, and lead, with the exception of I2-4, which was not analyzed for mercury and lead (PAP-00244664). Only the following PAHs were detected; phenanthrene (0.025 mg/kg), pyrene (0.031 mg/kg), chrysene (0.025 mg/kg), and benzo(a)anthracene (0.026 mg/kg) from sample I2-1B at a depth of 9.5-10 ft bgs.

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Further soil delineation investigations at Area I2 in 1992 were not evaluated for COCs associated with OU2 and included only petroleum hydrocarbons and bis(2-ethylhexyl)phthalate. Based on additional delineation conducted, and the very limited access to this Area due to its location in a building basement, Okonite proposed institutional controls for Area I2 (PAP-00260513). NJDEP conditionally approved institutional controls for Area I2 in 1994 (PAP-00240168, 72).

Area K

Area K is an unpaved area that was partially covered with a tar-like substance and resin beads from the facility water softeners. Plant personnel reported that empty drums were also historically stored in this area. Approximately 200 cubic yards of soil was removed. A total of 15 post-removal soil samples were collected following the first excavation on January 23, 1993. Samples were analyzed for TPH, VOCs, BNs, lead, and zinc. Several PAHs were detected in this area following round 1 excavation. The soils removed during the first soil event consisted entirely of ash and cinder fill. The fill in this area contained parts of plumbing fixtures, glass vials, metals lids, etc. Okonite concluded that, due to the analytical results of the first round of post-removal samples, a second soil removal event was required. Subsequently, an additional 100 cubic yards were removed and post-removal sampling was conducted on December 7, 1990. Following the second excavation, 1142 post-removal soil samples were collected from the excavation base and the base of the sidewalls. These samples were analyzed for TPH, BNs, lead, zinc, mercury, copper, and PCBs.

In the October 1992 Results of Supplemental Sampling Plan Implementation, NFA was recommended (PAP-00245806). The NJDEP conditionally approved NFA with the requirement that the previous data be reevaluated to the then-applicable RDCSCC (PAP-00240168, 72-3). The data for sample K-16/9.5-10.0 met then-applicable RDCSCC for BN compounds (PAP-00260518). The NJDEP approved NFA for Area K in their comment letter dated January 20, 1995 (PAP-00240081).

Area M

This area was identified as an area of potential environmental concern during on-going facility decontamination/decommissioning activities when the Banbury mixer (rubber compounding machine) was removed. The area is approximately 20 by 10 feet in size and, the bottom of the pit is approximately 3 feet below grade, and consisted of several concrete sub-chambers. The sub-chambers were mostly filled with soil and sediment but also contained minor amounts of rubber compounding waste. Removal of the fill material revealed that the floors and walls of the sub-chambers are not continuous throughout the structure (i.e., gaps are present). The fill material that was removed prior to the submittal of the February 1992 Results of Sampling Plan Implementation and Supplemental At-Peril Activities report (approximately 15 cubic yards) was staged beside the pit. A waste classification sample was collected from this material. No PAHs were detected (PAP-00244684).

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Drainage Structures

No sediments are present at the site; however, Weasel Brook forms the western boundary of the site. Okonite collected 13 sediment samples from Weasel Brook in July 1992. The samples were analyzed for metals, VOCs, base neutrals, and total organic carbon. Sample locations were biased towards the areas where outfall pipes, at the furthest upstream end of the brook on the site (PAP-00243477), discharged to Weasel Brook. Samples of stream bank and/or bottom sediments were collected where available, beneath three of the facility outfall pipes and at a location downstream of the facility outfall pipes. A sample was not collected at the upstream end of the brook at the property because the brook enters the property boundary in a covered culvert. The bottom of the brook was concrete and stone where it exited the culvert and no sediment was present for sampling. A number of PAHs were detected in two bank sediment samples and three bottom sediment samples, including SS-3 at a depth of 0-6 inches. According to the Remedial Action Report (RAR), dated December 17, 2003, the source of these PAHs was unknown (PAP-00259165). However, a possible source was the historic fill in the area, which also contained PAHs (PAP-00259165). A significant amount of time had passed since Okonite's industrial discharges to the brook ceased. Normal processes of erosion and deposition have likely made sediment conditions at that time non-representative of any impacts Okonite's operations may have had (PAP-00243478).

On May 5, 2004, additional sediment samples were collected from Weasel Brook at a previous location of SS-3/0-6" collected in 1992 for total organic carbon, TPH, and BNs. During that sampling event, waste automotive parts were observed in Weasel Brook, and had been dumped from the bank opposite of Okonite (PAP-00258638).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file material.

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OTIS ELEVATOR COMPANY

Facility Name, Address and Size: Otis Elevator Company (Otis), 1000 First Street and 1001 South Second Street, Harrison, New Jersey, 07029. According to a February 25, 1980 Passaic Valley Sewerage Commissioners (PVSC) Sewer Connection Application the site consisted of: Block 73, Lots 1-19, Lot 20A, Lots 22-26, Blocks 74-77, Block 80, Lot 1, Lot 2, Lot 13, Block 101, Block 102, Lots 1-11, Lot 33B, and Lots 34-45) (PAS-00076743). At its peak size (during World War II), the site consisted of approximately 40 acres (PAS-00076875). Post-war, the site consisted of approximately 33 acres (PAP-00233774; PAS-00076657), and then decreased as various and ultimately all parcels were sold off (see below).

The original site was about six acres. The first payroll in 1910 covered about 90 employees. There were approximately 850 employees in 1929, (PAS-00076851), followed by significant decreases during the Great Depression. Employment rebounded to 500 by 1941, shortly before the United States' entry into World War II, and peaked during World War II at 1,500 employees (PAP-00233755), also reported as "close to 2,000 employees" (PAP-00233755; PAS-00076871). Following a significant decrease at the end of World War II in 1945, total employment fluctuated (1,000 in 1972 (PAS-00076657), 260 in 1977 (PAS-00076856); 487 in 1979 (PAP-00233785), 430 and then 200 in early 1980 (PAS-00076743; PAS-00076856) until the facility closed in 1980 (PAS-00076854; PAS-00076856).

1. Business Type: The purpose of the Otis plant was to form and assemble elevator cabs, doors and platforms. The manufacturing process involved receiving sheet metal and steel beams from other sources and then bending, cutting, and stamping metal into the shapes required to form and assemble the products. Metal scrap was collected and sold to a metal scrap dealer off-site. In addition, for approximately four years, Otis manufactured airplane engine crankcases and other military equipment under direction of the U.S. government (PAS-00076817).

2. Time Period of Ownership/Operations

Operator: February 1, 1910 – August 31, 1980

Owner: 1910 – December 16, 1980

(PAS-00076732; PAS-00076854; PAS-00076828; PAS-00076834)

According to a Response from Otis Elevator Company dated August 1996, the plant began with a limited number of buildings and space, originally purchased from the Marine Engine and Machinery Company, and both increased and decreased in capacity and size during its years of operation. During those years, there were a large number of purchases and sales to and from individuals and corporations. In addition, as noted below, in the years immediately following World War II, there were various limited lease relationships for certain buildings.

1910: On January 1, 1910, Otis leased all the lands and premises bound by Railroad Avenue, Second Street, Somerset Street, and the Passaic River with all their appurtenances, including all riparian rights, machinery, tools, fixtures, materials, and generally all its property and entire manufacturing plant from Marine Realty and Improvement Company (PAP-00233843).

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On February 1, 1910, an agreement was made whereby Otis took possession of a machine shop (February 1, 1910), foundry and pattern shop (April 1, 1910), and blacksmith shop and small frame building on the corner of First and Middlesex Streets, in which the plant, machinery, pattern storage building, and offices were located (September 1, 1910) (PAP-00233851).

According to an August 26, 1996 response to an Environmental Protection Agency (EPA) Request for Information, Otis began operations at 1000 First Street (the "Harrison Plant" or the "Plant") in 1910. At that time, the Plant consisted of a gray iron foundry, machine shop, a powerhouse and office, the total floor area was approximately 95,000 square feet. As the need for additional manufacturing facilities occurred, several buildings were erected between 1910 and 1929 reaching 334,750 square feet (PAP-00233776; PAS-00076817; PAS-00076850).

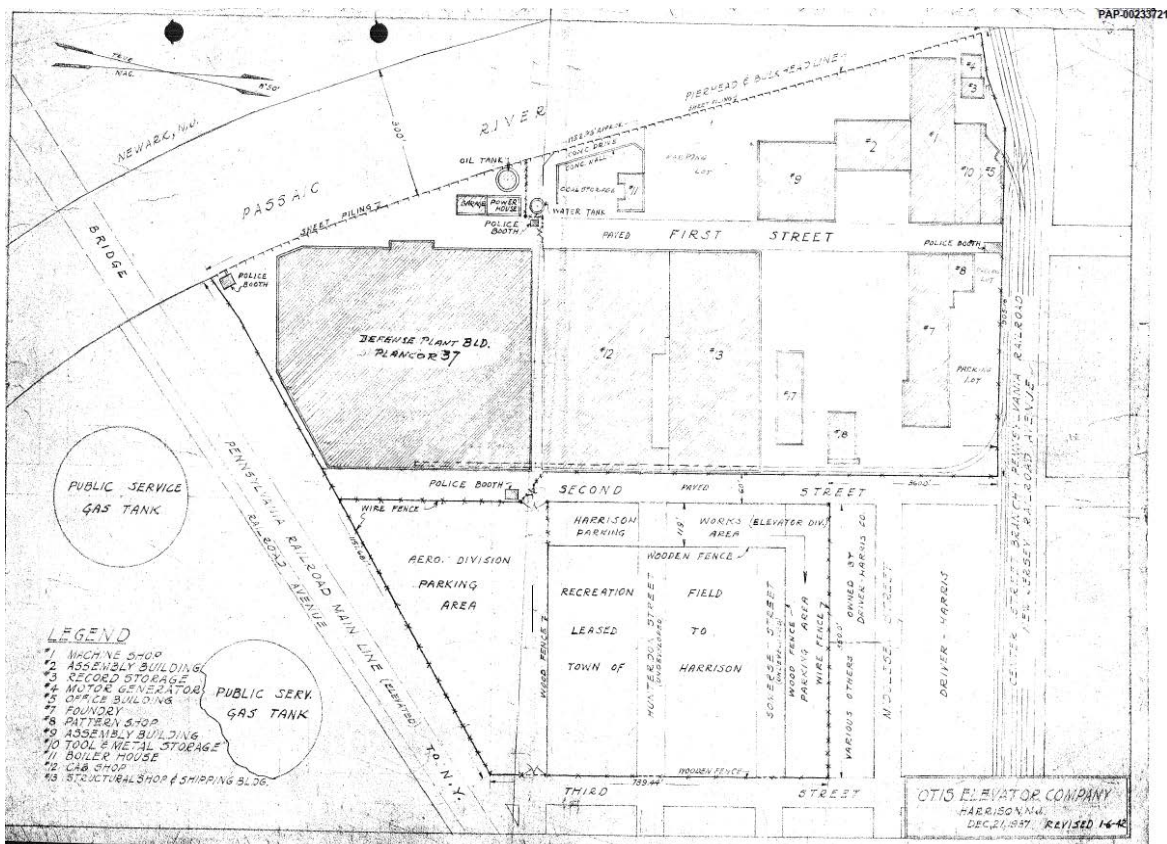
- 1928: As part of this construction, an 115,000 square feet heavy capacity general manufacturing building was constructed, and Otis opened the Central Heating Plant, which was designed for heating and to provide facilities for cold storage handling of highly explosive powdered fuel (PAS-00076733).
- 1941- 1942: The U.S. government acquired from Otis the large undeveloped parcels at the southern and southeastern ends of the Facility site. Under U.S. government oversight, Otis constructed and operated two new manufacturing buildings (Aeronautical Division Buildings One and Two) on these parcels to produce military parts and equipment for the government (PAP-00404016; PAS-00404038; PAS-00048611, PAS-00076724, PAS-00076870).
- 1946: Otis acquired the southern parcel and Aero Building One from the U.S. government (PAS-00048611).
- 1947: Otis leased four aisles, Nos. 1-4, in Aero Building Two at 1001 South Second Street, Harrison, New Jersey (PAP-00233766).
- 1957: Radio Corporation of America deeded property to Otis Elevator on November 4, 1957 and recorded on November 12, 1957 in Book 2733 at page 490 (PAP-00233793).
- 1958: Buildings at the facility used for manufacturing operations totaled approximately 556,000 square feet of manufacturing space, and 138,000 square feet for storage, power production, offices, and other nonmanufacturing uses (PAP-00233774).
- 1974: United Technologies purchased Otis making Otis a wholly owned subsidiary of United Technologies (PAS-00076819).
- 1978: Otis deeded lots 23 to 32 and part of lot 33 in Block 100, lots 13 to 32 and parts of lots 12 and 33 in Block 101, lots 13-32 and part of lots 12 and 33 in Block 102 to Pathparc Associates, a partnership (PAS-00076832).

Otis Elevator Company

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- 1979: Plant area for manufacturing was 27,585.35 square meters (approximately 293,000 square feet) and for office was 3,993.20 square meters (approximately 43,000 square feet), with 241 employees for production, 146 technical and clerical, and 100 management employees for a total of 487 (PAP-000233789, PAP-00233785).
- 1979: Otis deeded parts of lots 1 through 11, part of lot 12A, and all of lot 46C in Block 101 to Newark Public Radio, Inc. on October 3, 1979 (PAP-00233793).
- 1980: The plant limited its operations to clearing out unfinished orders and reduced its total employee count from 200 to 85-90 on May 19, 1980 (PAS-00076856). The plant ended all operations on August 31, 1980 (PAS-00076854). Block 101, Lot 1-A (was sold on December 16, 1980 to Hartz Harrison Limited Partnership (PAS-00076828) and Harrison Riverside Limited Partnership (PAS-00076834).
- 1991: As reported in a letter from Otis to the U.S. Environmental Protection Agency (EPA) regarding EPA's Notice of Potential Liability dated January 1998, Harrison Riverside Limited Partnership leased a portion of the facility to its tenant, Intrex Corporation (PAS-00076579; PAS-00076603).



(PAP-00233721)

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3. Operational History/COC Use and Presence at the Facility

According to *Otis Harrison Plant Parallels Growth of Hudson County*, dated March 8, 1971, the original Otis plant in Harrison opened for business on February 1, 1910. At that time, the plant comprised eight buildings occupied by the Marine Engine and Machinery Company, located on the east bank of the Passaic River. The original layout had a machine shop, an iron foundry, a structural steel shop (to assemble elevator car frames and safety devices), a forge shop, powerhouse, and general office building. Improvements through the years added 10 new buildings, modernized all the original structures, and spread the plant over an area of about forty acres at its peak during World War II. In 1928, a building of 115,000 square feet of heavy capacity floor space for general manufacturing was added. The same year also witnessed the opening of the Central Heating Plant, designed not only for heating, but also to provide facilities for cold storage handling of highly explosive powdered fuel (PAS-00076732-33). A May 29, 1939, booklet also reported another building entirely devoted to the company's elevator lubricants. This included oils and greases for all of the various requirements for elevator, escalator, and hoisting apparatus (PAP-00404032).

According to an August 26, 1996 response to an EPA Request for Information from Otis, the purpose of the Harrison Plant was to form elevator cabs, doors and platforms. The manufacturing process involved receiving sheet metal and steel beams from other sources and then bending, cutting and stamping metal into the shapes required to form the products. Metal scrap was collected and sold to a metal scrap dealer in Harrison (PAS-00076817). In addition, the plant manufactured airplane engine crankcases under direction of the U.S. government from August 1941 until August 14, 1945. An early production target for the first type of crankcase produced was for 2,500 units per month (PAP-00233746-48). There is no information in the documentation provided regarding actual production levels.

According to Harrison Works of Otis Elevator Company, in 1941, Otis also started war production of elevator platforms and ammunition hoists for the U.S. Navy Cruisers, and within a relatively short time it was producing machine tools, gun turrets, aircraft landing gear, steam pumps, cowl rings, parts for 27,000 welding generators, cradles for nearly 4,000 recoil mechanisms, assemblies for torpedo hoisting equipment, portions of mine handling elevators for mine layers, and more than 1,300 aluminum-alloy crankcases for airplane auxiliary power units (PAP-00233754; PAP-00233764-65).

Otis's response to the *Request for Information*, dated August 1996, reported there was a small section of the Harrison Plant that performed spray painting in enclosed booths. The excess paint was collected into 55-gallon drums, which were then sealed and stored in the parking lot until collected and taken off-site by a waste hauler (PAS-00076817; PAS-00076716).

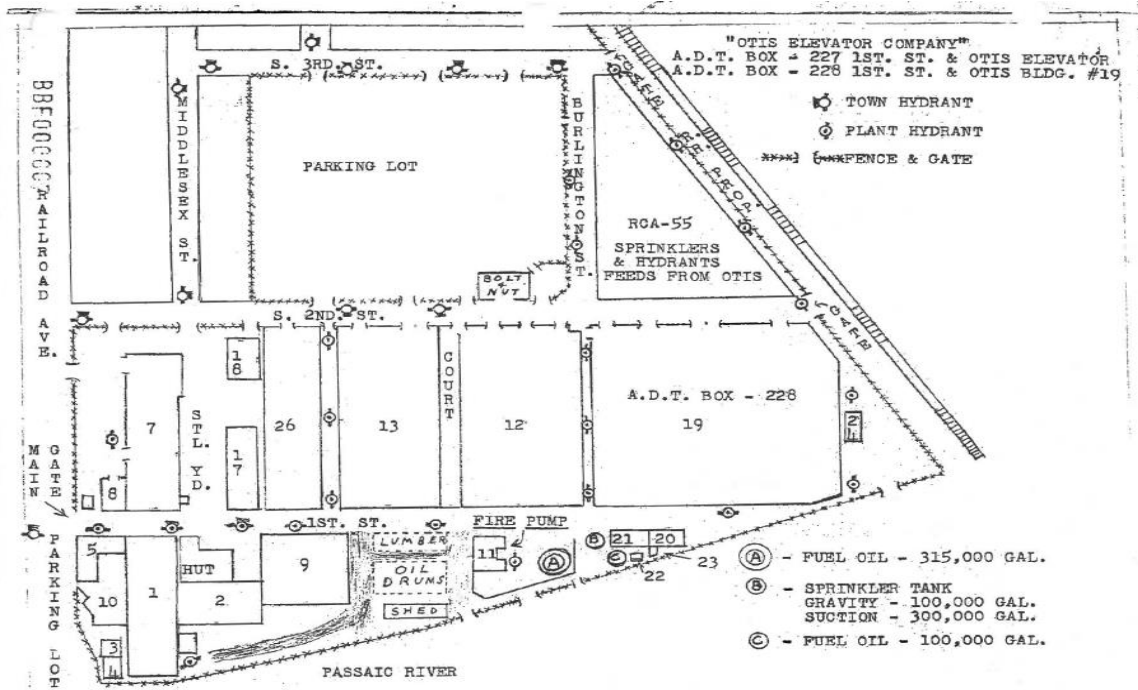
A small incinerator was located at the site on or after 1941, within a 160-square-foot enclosure (Building 23), as depicted below (PAP-00233774).

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According to an inter-office correspondence letter dated Aug 14, 1929, at the time of purchase in 1910, a gray iron foundry was reported to be a part of the plant as depicted as Building 7 in the facility layout (PAS-00076850; PAP-00233721).



(PAP-00233841)

OTIS ELEVATOR CO.		1000 FIRST STREET		A.D.T. BOX 227 - 228
BLOG.	RISERS	DEPT.		
1	1	13 & 27	1ST. FL. HEAVY MACH. SHOP - 2ND. FL.	
2	9-9A-9B	13	MILLING MACH. SHOP	
3	3	SERV.	RECORD VAULT	
4		24B	MAINTENANCE	
5		25 & SERV.	GEN. SHOP AREA & LOCKER ROOM	
7	18-7C	19	RAIL & BEAM SHOP	
8	18-7C	9	1ST. FL. GARAGE - 2ND. FL. PERSONNEL	
9	9-9A-9B	23	TOOL ROOM & LIGHT MACH. SHOP (18)	
10	10	4	1ST. FL. STORES & 2ND. FL. STORES	
11		24	POWER HOUSE	
12	12-A,C,D,E,F	15	FREIGHT ELEVATORS - 2ND. FL. LOCKER ROOM	
13		15	STRUCTURAL SHOP	
COURT		15	FREIGHT ELEVATORS	
17		4	STORES	
18		17 & 1A	1ST. FL. SHIPPING - 2ND. FL. HARR. SER.	
19	1 THRU 12		OFFICES, CAFETERIA, LOCKER ROOM, METAL CAB & PAINT SHOP (A.D.T. BOX - 228)	
20		9A	ELECTRIC TRUCK GARAGE	
21			AERO POWER HOUSE	
22			BATTERY ROOM	
23			INCINERATOR	
24			PAINT MIXING ROOM (A.D.T. BOX - 228)	
26			STORES	

0
(PAP-00233842)

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4. Identified COCs

- PCBs (potentially used)
- PAHs (used)
- Coper (released, detected)
- Lead (reported used, released, detected)
- Mercury (released, detected)

According to a November 21, 1996 Memorandum, processes utilized at the facility generated wastes, including metals, solvents and paint sludge. The facility also stored highly explosive powdered fuel for some period of time (PAS-00076710). According to a January 17, 1977 Industrial Waste Survey estimated quantities of paint sludge was 100 cubic yards per year (PAP-00456839).

PCBs

According to an *Environmental Due Diligence Assessment of Habitat International, Ltd.*, as of 1988, three transformers were located in the building leased by Intrex on the opposite side of First Street. Intrex leased these transformers as part of the building. The transformers were tested by the site owner at that time with the results reported as "less than 50 parts per million (ppm)" PCBs (PAS-00076788). No staining was noted in the investigation of the area (PAS-00076738).

PAHs

According to an *Environmental Due Diligence Assessment of Habitat International, Ltd.*, there was one aboveground fuel oil tank on a diked pad with a capacity of 120,000 gallons. This tank was located on the opposite side of First Street, and it reportedly contained No. 2 fuel oil used to fire the boiler (PAS-00076790). The fill location for the tank was observed and noted to be diked and clean (PAS-00076796). Available references did not include soil characterization data for PAHs.

Metals - Mercury, Copper, Lead

As reported by the *PVSC Industrial Waste Survey Results*, dated June 26-28, 1978, Otis's wastewater metal measurements contained 0.199 milligrams per liter (mg/L) copper contributing 0.159 lbs/day to PVSC; 0.141 mg/L lead contributing 0.113 lbs/day; and, 0.0057 mg/L mercury contributing 0.0046 lbs/day to PVSC (PAS-00125049, PAS-00076719).

According to the July 25, 1972 *Waste Effluent Survey Chart* of plant waste attributable to Otis, lead concentrations were 0.07 mg/L with a daily discharge of 0.11 lbs per day; copper concentrations were 0.03 mg/L with a daily discharge of 0.05 lbs per day (PAS-00076661).

According to an *Environmental Concerns Tracking Sheet for ECRA Case 91646* by Intrex Corporation, an underground storage tank (UST) was reportedly used by Otis to fuel vehicles. The tank and pump were removed in November 1986. Soil samples were

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collected and contained a maximum lead concentration of 1,624 milligrams per kilogram (mg/kg) (PAS-00076739).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the New Jersey Department of Environmental Protection (NJDEP).¹

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.² Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH contaminants of concern COCs).³ PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.⁴

The levels of lead detected at the site in soils are presented in the table below (PAS-00076739).

COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	1,624 mg/kg

A Specification for Cab Manufacturing Building (Building 12) reports the previous building operation noted that the upper 6-8 feet of soil is fill (PAP-00233804). Historic mapping shows that the southern portion of the site was filled and subdivided at some point between 1905 and 1907, prior to Otis' ownership and operations beginning in 1910. Subsequent historic aerial photos and mapping also show that at least some of the shoreline of the filled area was stabilized or reinforced. Additional bulkhead was later added along the entire shoreline of the Facility (PAP-00233720; PAP-00233775; PAP-00233864; PAP-00233721). There is no indication from a review of provided documents that facility operations disturbed contamination located in historic fill; however, a Specification for Cab Manufacturing Building (Building 12) reports excavation was required for the piers and wall beams (PAP-00233806).

¹ *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, <https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm>, Quadrangle #52 and #53 (NJDEP map identifying locations of recognized historic fill).

² *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

³ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

⁴ NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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According to a May 18, 1942 Resolution by the Town of Harrison Otis was granted permission to grade, pave, curb, and install catch basins on Third Street and Burlington Street in accordance with specifications approved by the Town Engineer's Department (PAP-00456842).

5. COC Pathways

Storm Sewers

An *Environmental Due Diligence Assessment of Habitat International, Ltd.* prepared for CIT Group/Business Credit, Inc., dated May 1988, states that "[s]tormwater drains directly to the Passaic River" (PAS-00076789). The NJDEP EPCRA Environmental Concerns Tracking Sheet for Intrex states, "all storm drains to the Passaic River" (PAS-00124586). However, a site plan from the period of Otis' ownership and operation shows certain roof drains as draining to the PVSC and catch basin draining to the PVSC subject to an overflow to the river (PAS-00076750). The same undated document also stated that the northeast loading dock had a drain to the river, which was sealed in 1985 (PAS-00076736).

Sanitary Sewer

According to a letter to Otis from the Town of Harrison's Chief Engineer, Joseph A. Cundari, dated December 9, 1997, the Town of Harrison connected to the PVSC's sanitary sewer interceptor system in 1924. Otis connected to the Town of Harrison's combined sanitary and stormwater sewerage system prior to 1924, noting that the exact date was not available. The only discharges allowed to the River were those which were considered as non-polluting, such as non-contact cooling water or treated effluent (PAS-00076655; PAS-00076592).

According to a May 18, 1942 Resolution by the Town of Harrison Otis was granted permission to provide connection for sanitary sewage to the PVSC that was already in existence for the erection of a building to be used in the manufacture of war time equipment and to install suitable storm and surface sewers to connect to with the Passaic River (PAP-00456842-43).

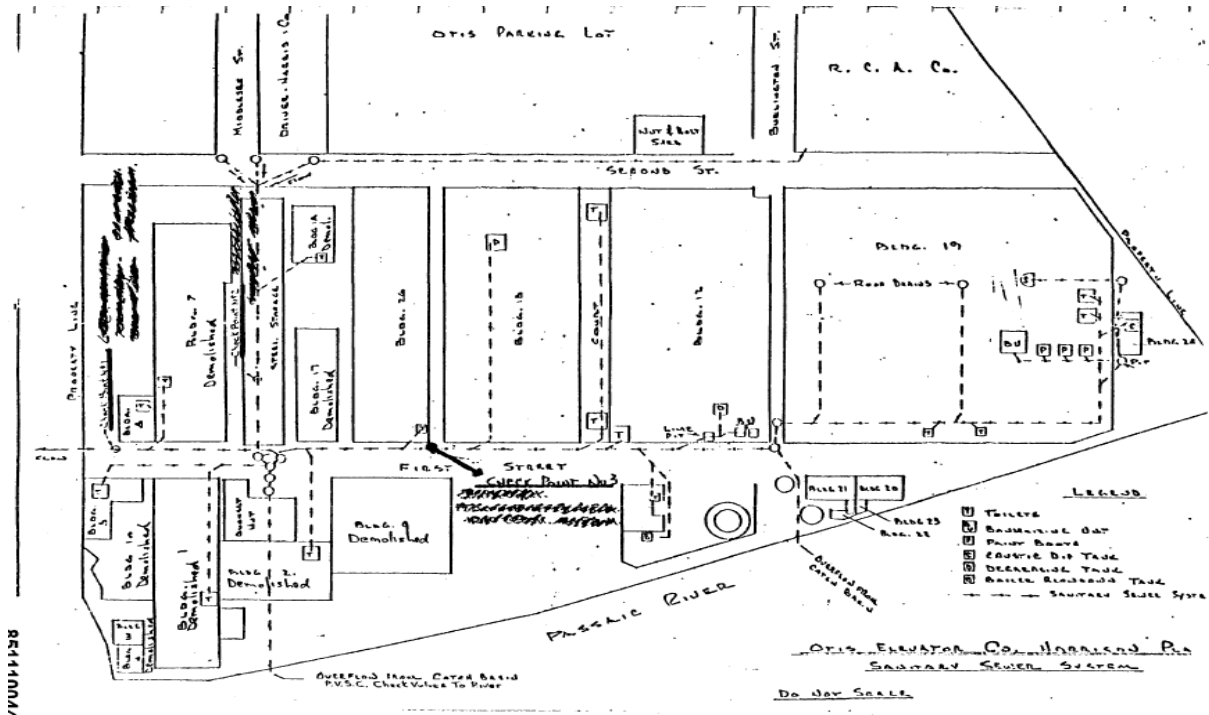
According to the Affidavit of Seymour A. Lubetkin dated January 8, 1998, toward the end of the 1970s, the PVSC required each of its industrial users to obtain sewer connection permits. PVSC required this even though the users may have been previous long time dischargers to the PVSC system (PAS-00076595).

According to the February 1980 PVSC Sewer Connection Application, Otis discharged 11,784,920 gallons of sanitary sewer water and 19,100,000 gallons of water ascribed to the application form category of "separate storm sewer, river, or ditch" in 1978 (PAS-00076744). Otis stated it discharged 48,000 gallons of water containing industrial waste to the PVSC daily. The discharge of industrial waste was continuous and occurred between 7:45 A.M. to 6:15 P.M. (PAS-00076745-46).

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(PAS-00076750)

According to a notebook kept by Seymour A. Lubetkin of the PVSC and prepared in approximately 1971, Otis had four storm sewer lines discharging and twelve outlets in total from its property to the Passaic River (PAS-00076711; PAS-00076741), as depicted below:

Otis Water Usage in gallons			
Reporting Year	Discharged to Sewer	Discharged to River	Total Water Use
1971	46,440,000	17,610,730	64,050,730
1974	27,412,720	26,174,000	53,586,720
1976	26,294,900	10,805,900	37,100,800
1978	11,784,920	19,100,000	30,884,920

(PAS-00076744; PAS-00076665; PAS-00076667; PAS-00076658)

According to a PVSC Sewer Connection Application dated February 25, 1980, Otis had one 12-inch sewer connection to the PSVC discharging 48,000 gallons of water containing industrial waste daily (PAS-00076746).

According to a June 1, 1977 Industrial Sewer Connection Application, Otis continuously discharged 101,000 gallons per day to the PVSC system (PAP-00233778).

Water bills from January 3 to February 1, 1910 show a total of 59,000 cubic feet of water being consumed (PAP-00233854; PAP-00233855).

Otis Elevator Company

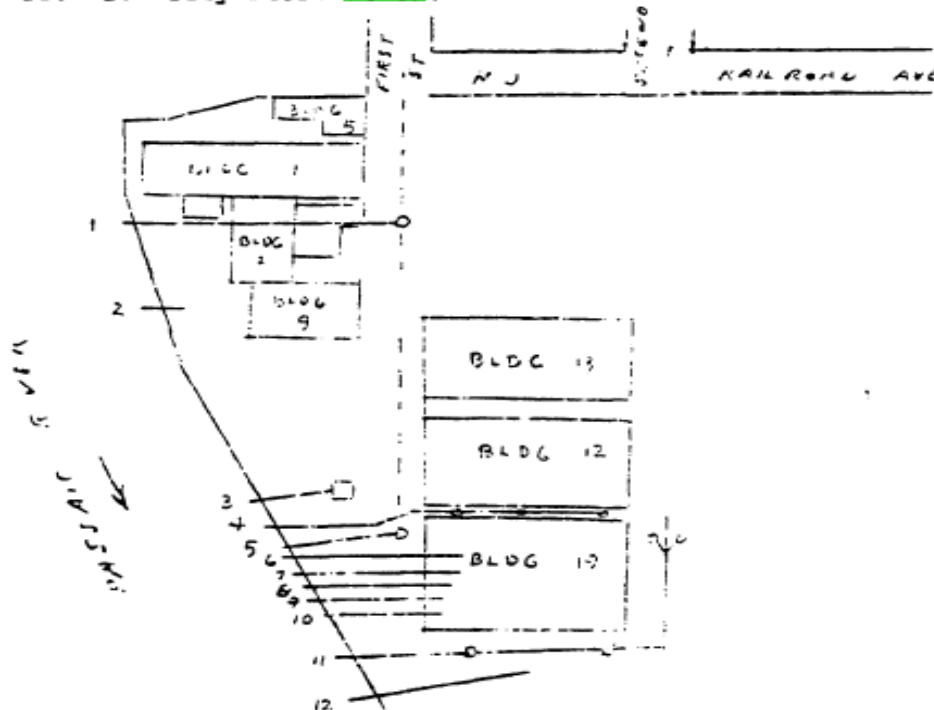
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Otis Elevator Company

This company has twelve outlets from its property to the
Passaic River, as follows:

1. 24" storm and overflow sewer;
2. 17" storm sewer;
3. 6" line from drain area;
4. 6" catch basin drain line;
5. 10" sanitary sewer overflow;
6. 12" cooling water and roof drain line;
7. 10" cooling water and roof drain line;
- 8.
9. 10" roof drain lines;
- 10.
11. 10" street catch basin line;
12. 16" city storm sewer.



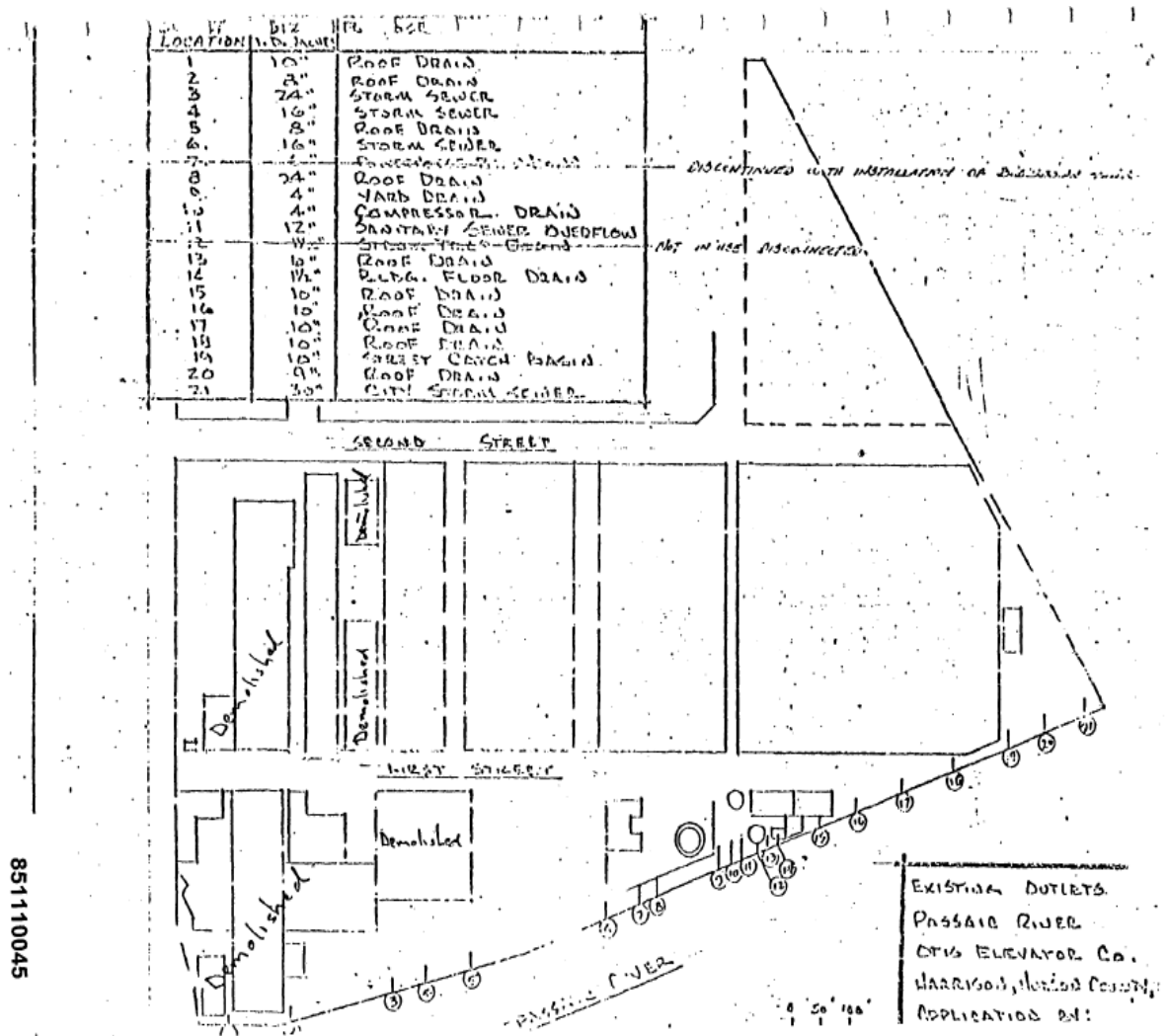
(PAS-00076741)

According to a PVSC Sewer Connection Application dated February 1980, the facility reported 19 existing outfalls and 2 discontinued/disconnected outfalls to the Passaic River, as shown below (PAS-00076743-51).

Otis Elevator Company

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(PAS-00076751)

According to a 1976 Overflow Analysis, the Middlesex Street overflow chamber was located 150 feet south of Otis's main gate and during periods of rainfall would discharge to the Passaic River instead of the PVSC (PAS-00115713).

Direct Discharge

According to a site *Description and Environmental Characterization Report*, stormwater drained directly to the Passaic River (PAS-00076789).

According to an a January 8, 1998 affidavit of Seymour A. Lubetkin, Chief Engineer of the PVSC from 1954 to 1978, prior to the completion of the PVSC treatment plant and trunk sewer in 1924, when the PVSC accepted the wastes from the municipalities (including Harrison), the municipalities discharged their wastewater into the Passaic River (PAS-00076577; PAS-00076592; PAS-00076596).

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According to the *Report on the Quality of the Interstate Waters of the Lower Passaic River and Upper and Lower Bays of New York Harbor*, dated November 1969 and prepared by the U.S. Department of the Interior, the Federal Water Pollution Control Administration and the New Jersey State Department of Health (NJDOH) conducted an outfall study from June to November 1969 to locate wastewater discharges to the Passaic River. The report noted PVSC conducted its own survey, which was not available for inclusion. The report stated that Otis had various pipes (18-inch, 8-inch, 6-inch, and "small pipes") discharging to the river. No samples were taken (PAS-00115428; PAS-00115445; PAS-00115448).

As reported by a Memorandum to EPA from Chemical Land Holdings, Inc. on behalf of Occidental Chemical Corporation, dated November 1996, NJDOH issued a Cease and Desist Order to Otis. According to the Cease and Desist Order, dated October 3, 1969, NJDOH found after conducting an investigation that Otis was "discharging harmful, deleterious and polluting matter from a sewer or drain into the Passaic River," including, but not limited to, "industrial waste". NJDOH ordered Otis to "install and provide wastewater treatment and / or disposal facilities" and cease the discharge (PAS-00076756). According to a NJDOH memo dated January 9, 1970, on December 9, 1969, a representative of NJDOH visited the facility to determine compliance with the administrative order. The memo states company officials believed they found the source of pollutants; an overflow from the sanitary sewer. The pipe ran past a collection basin into which a generator blow down was discharged. The joints on the overflow pipe were broken, and a crack existed in the bottom of the collection basin. The company repaired the joints in the pipe, poured new concrete in the floor in the collection basin, and ceased the discharge" (PAS-00076758). According to a January 7, 1970 NJDOH letter to Otis, the December 9, 1969 inspection confirmed that the company's work was sufficient to correct the suspected source of pollution material and upon which the October 3, 1969 Order was issued (PAS-00233777).

According to the *Annual Report to the PVSC Commissioners for the Year 1972*, prepared by PVSC Chief Engineer S. A. Lubetkin, on December 20, 1971, S. A. Lubetkin directed Otis to halt pollution caused by the discharge of boiler blowdown water into the Passaic River. Work on a pipeline to re-route this discharge to the sanitary sewer was completed as of February 3, 1972 (PAS-00076762-63).

According to attorney notes associated with 1996-97 and 2006 interviews of former Otis employees, a few former employees spoke of personnel occasionally throwing poorly machined metal parts into the river, but it is not clear whether any employees actually observed any such incidents. Another former employee stated that a fellow employee had occasionally disposed of water-based coolant collected from metal cutting operations into an exterior drain or other such structure, believed to drain to the primary wastewater discharge line that ran from the facility to the PVSC sewer system. It is unclear whether any of these materials referenced by former employees contained COCs.

According to a 1976 *Report on Overflow Analysis* submitted to the Passaic Valley Sewerage Commissioners, prepared by Elson T. Killam Associates, Inc., the Middlesex Street Overflow Chamber was located 150 feet south of Otis's main gate. Under dry

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flow normal conditions, the flow was diverted to the PVSC interceptor via the regulator. During periods of rainfall, a portion of the combined flow entered the PVSC interceptor, with the balance overflowing the stop logs and discharging through the outfall line into the Passaic River during periods of rainfall (PAS-00115713).

In early 1980, the facility reported 19 existing outfalls and 2 discontinued / disconnected outfalls to the Passaic River in a PVSC Sewer Connection Application (PAS-00076751).

The 1972 Annual Report by PVSC Chief Engineer Seymour Lubetkin stated that per PVSC direction, Otis re-routed its boiler blowdown to the sanitary sewer effective March 3, 1972 (PAS-00006172). However, according to the November 24, 1997, Affidavit of Alan Mercer, the Environmental and Safety Supervisor for Intrex from 1986 to 1991, the Site Evaluation Summary (SES) prepared by Intrex in 1991 states that boiler blowdown was discharged to the Passaic River from 1940 until 1983. Mr. Mercer further states that Intrex took possession of the property in 1981 as leasee to the Harrison Riverside Limited Partnership. Mr. Mercer states that when Intrex took possession of the property in 1981, it renovated Building 21 and installed oil-gas boilers for heating the facility. For a time, boiler blowdown was discharged through a floor drain in this building to the Passaic River until approximately 1987. In 1987, NJDEP ordered Intrex to cease its discharge of boiler blowdown to the River. Intrex dug up the floor and rerouted the discharge to the PVSC. Mr. Mercer states that in completing the SES, he had assumed Otis had been operating the same way as Intrex, but did not know whether Otis had discharged any blowdown to the River (PAS-00076603-06).

According to an undated NJDEP *Environmental Concerns Tracking Sheet* for Intrex, several inactive paint drains from the paint spray room went to the Passaic River which were sealed prior to Intrex's occupancy in 1981 (PAS-00076737). Note the date of sealing was not provided in the available documents.

According to the Affidavit of Seymour A. Lubetkin dated January 8 1998, Otis's paint booths were connected to the sanitary sewer system and did not discharge to the Passaic River (PAS-00076582). However, the sewer connection map below shows the sanitary sewer connecting to a catch basin that sent overflow to the Passaic River.

According to the Affidavit of Robert J. Bodnar dated November 29, 1997, while Mr. Bodnar was employed at Otis, Building 21 housed water-cooled air compressors. The cooling water never came in contact with any of the industrial processes at the facility. The compressors' cooling water was discharged from this building to the Passaic River. In addition, Building 21 was never used for the generation of steam to heat the facility. Otis held a permit for the discharge of its compressor cooling water to the Passaic River; all samples tested were satisfactory, and Otis never had a violation because of its cooling water discharge. In the early 1970s, a governmental agency had notified Otis that a discharge of blowdown from the Otis facility to the Passaic River had occurred, and upon receiving the notice, Otis ceased the discharge (PAS-00076599-600).

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Spills

A May 1998 *Environmental Due Diligence Site Assessment* by the subsequent operator Intrex, did not identify any indications of spills or releases associated with Otis and noted no major stains (PAS-00076736-38, 772).

6. Regulatory History/Enforcement Actions

Inspections and Violations

According to the January 8, 1998 Affidavit of Seymour A. Lubetkin, the PVSC had set up a river monitoring system to determine if any parties were discharging polluting material to the Passaic River. A review of the annual reports from 1969 through 1976 and the 1977 Draft Report only mention Otis in 1969, 1971, and 1972 for two minor violations (PAS-00076592-93).

According to a Cease and Desist Order from NJDOH to Otis dated October 3, 1969, Otis had been found to be in violation of RS 58:12-2. NJDOH found that Otis had been discharging harmful, deleterious and polluting matter (discussed below) from a sewer or drain into the Passaic River (PAS-00076756-58).

According to the January 8, 1998, Affidavit of Seymour A. Lubetkin, in 1969, a four-inch underground oil pipe had cracked, and oil seeped underground to an adjacent storm overflow pipe that had also cracked. The pipes were excavated and repaired by Otis as soon as Otis was notified. The pollution was discovered on November 14, 1969 and eliminated three days later on November 17, 1969 (PAS-00076593).

According to the Annual Report to the Passaic Valley Sewerage Commissioners for the Year 1972, prepared by Chief Engineer S. A. Lubetkin, Otis received a violation for samples taken on December 14, 1971 from the five outlets that were flowing (7, 8, 10, 15, and 16). The discharge from Outlet 7 had been polluting. On January 6, 1972, Otis notified the Commissioners that steps had been taken to reroute the boiler blowdown discharge to the sanitary sewer. On March 6, 1972, PVSC staff checked the work and confirmed that all work was completed and that the 6-inch pipe to the river had been sealed off, thus eliminating the pollution (PAP-00319432-33; PAS-00006171-72; PAS-00076763-64).

Permits

According to Otis's January 30, 1998 response to EPA's Notice of Liability dated July 1, 1997, Otis had not been able to obtain a copy of its NPDES permit, draft permit, or permit application (PAS-00076582-83). However, according to a Right-to-Know Network's printout obtained by Otis, NPDES permit NJ0002941 for Otis was issued on May 31, 1974 for five outfalls. The printout also states that the permit authorized discharge of "SANI COOLING" effluent, indicating sanitary wastewater and non-contact cooling water. The permit parameters included: chemical oxygen demand (COD) (daily maximum 50 mg/L), oil and grease Freon extra-grav meth (daily maximum 10 mg/L), pH (minimum pH 6, maximum pH 9, daily maximum 10 mg/L), chromium (daily maximum

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500 micrograms per liter ($\mu\text{g/L}$), zinc (daily maximum 1000 $\mu\text{g/L}$), and flow (PAS-00076669-81). According to the Affidavit of Seymour A. Lubetkin Assistant Chief Engineer of the PVSC the printout notation for "SANI" is likely an error, since (among other things) it is not consistent with the permit having no monitoring or limits for suspended solids, fecal coliform or biochemical oxygen demand (BOD) (PAS-00076595).

A June 1, 1977 Industrial Sewer Connection Application to the PVSC is signed by Otis, approved and signed by the Town of Harrison, but the PVSC approval and signature fields are blank (PAP-00233778). According to a response to EPA's Notice of Potential Liability dated 1998, Otis submitted an application to the PVSC in February of 1980 for its existing sewer connection. Otis did not receive Permit 98151-13280 because it closed its facility sometime later in 1980 (PAS-00076584; PAS-00076753).

7. Response Actions

Characterization Activities

- May 1998 Environmental Due Diligence Assessment of Habitat International, Ltd. (PAS-00076782).

The February 26, 1998 Application for ECRA Review Initial Notification filed with NJDEP stated that Otis Elevator operations did not involve spills or discharges of hazardous substances or wastes into the soil, groundwater or air (PAP-00456848). The due diligence inspection of April 20, 1988 noted the potential for impacts from fill material at the site, but did not find any indication of spills or discharges (PAS-00076784, 795, 800). An October 6, 1988 Report of Inspection for Intrex noted a stain inside alley- looks like side door was opened and unknown material dumped down storm drain (PAP-00456858). According to an October 31, 1988 Habitat Letter to NJDEP Intrex acknowledged responsibility (PAP-00456860).

A May 1998 *Environmental Due Diligence Site Assessment* by the subsequent operator Intrex of the largest manufacturing building at the site and adjacent support buildings (leased by Intrex in 1981), did not identify any indications of spills or releases and noted no major stains caused by Intrex with lead impacts in at-depth soils at a former UST location reportedly used by Otis Elevator to fuel vehicles (PAS-00076736-39, 772, 811). The *Environmental Concerns Tracking Sheet* specifies "no staining" in various Potential Areas of Concern (PAS-0076736, PAS-0076738). For one AEC (former location of a UST), NJDEPE required two rounds of subsurface sampling. First-round sampling results for lead at 4.5 bgs were 324 ppm, 228 ppm, 181 ppm, and 887 ppm, with an average of 405 ppm. Second-round sampling results for lead, also at 4.5 bgs, were 303 ppm, 1624 ppm, 396 ppm and 218 ppm, with an average of 520 ppm (PAS-0076739).

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Remedial Activities

NJDEP ECRA documents reported that Intrex cleaned the minor staining area identified in the NJDEP inspection (PAP-00456862). NJDEP then approved a Negative Declaration on January 12, 1989 (PAP-00456863).

According to the *Environmental Concerns Tracking Sheet* for Intrex, who leased a portion of the facility starting in 1981, No Further Actions (NFAs) were issued by NJDEPE in 1993 for the following areas of concern (AOCs): dust collectors and spray booths, sump in boiler house, sump in northwest corner of production building, storm drains, exterior temporary drum storage, interior of storage building, waste storage interior, oil water separator in southwest corner, floor drains from paint spray room, paint storage room, loading docks, 120,000-gallon aboveground storage tank (AST), three transformers, battery house, boiler room, dumpster area, hazardous waste from paint spray booths, discharges to Passaic River, and 1,000-gallon gasoline underground storage tank (UST) (PAS-00076735-39). Note that NFA letters were not available in the available material.

On December 7, 1993, the former Otis building located on 1000 First Street, Harrison Town, Hudson County Block 86, Lot 1 (now Intrex Corporation) was issued a No Further Action Letter (i.e., approval of Negative Declaration Affidavit). According to the letter, appropriate institutional controls are in place including, but not limited to, DER, which has been recorded with the County Clerk's Office (PAP-00233795).

8. Summary of Asserted Defenses

To the extent it is determined that a gasoline or oil release occurred at the Facility during the Relevant Time Period and impacted the Passaic River with COC(s), Otis will assert the CERCLA petroleum exclusion (42 U.S.C. §9601(14)).

To the extent it is determined that any discharge associated with another party crossed on, through or under the Facility during the Relevant Time Period and impacted the Passaic River with COC(s), Otis will assert that any liability for such a discharge falls outside the scope of Otis' potential liability under CERCLA.

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PABST BREWING COMPANY, LLC

Facility Name, Address and Size: Pabst Brewing Company/Pabst Brewing Co./E. Hoffman & Son Soda and Mineral Water Works; 400 Grove Street, Newark, New Jersey; Historically approximately 11 to 14 acres; 900 employees, 3 shifts per day, 6-7 days per week (PAS-00031808).

1. Business Type: Malt beverage production and distribution

2. Time Period of Ownership/Operations

Operator: 1945 or 1946 to 1985

Owner: 1945 or 1946 to 2003

1945: A March 26, 1992 Discharge Investigation and Corrective Action Report prepared by H&GCL states that Pabst Brewing Company (Pabst) purchased the site from E. Hoffman & Son Soda and Mineral Water Works (Hoffman) on November 15, 1946, and Hoffman and Pabst shared joint tenancy and production facilities for an unreported amount of time (PAS-00031669).

1961: In 1961, Pabst sold 100% of the stock of Hoffman to investors headed by Robert Sealfon (PAP-00286546).

1985: According to a July 21, 2004 data monitor company profile, prepared by Factiva, Inc., Pabst Brewing Company was acquired by S&P Company in 1985, whose ownership was given over to the Kalmanovitz Charitable Trust in July 2000 (PAS-00031659). In addition, according to a *Discharge Investigation and Corrective Action Report*, prepared by H*GCL, dated March 26, 1992, the facility ceased operation in July 1985 (PAS-00031669).

2003: Pabst sold the facility to New West Developers, LLC pursuant to a deed made on March 26, 2003, and recorded with the Essex County Register on April 3, 2003 (PAP-00293838).

2010: Pabst is currently a wholly-owned subsidiary of Pabst Holding, Inc., which acquired Pabst from S&P Company in 2010 (PAP-00293835).

3. Operational History/COC Use and Presence at the Facility

Pabst Brewing Company operations consisted of malt beverage production (PAS-00031711). Raw materials used in production did not include OU2 COCs, nor did operations include use of COCs (PAS-00031803). However, nine USTs were present at the facility that contained No.6 heating oil, No.2 diesel fuel and unleaded gasoline (PAS-00031922-23, 29).

Pabst Brewing Co., LLC

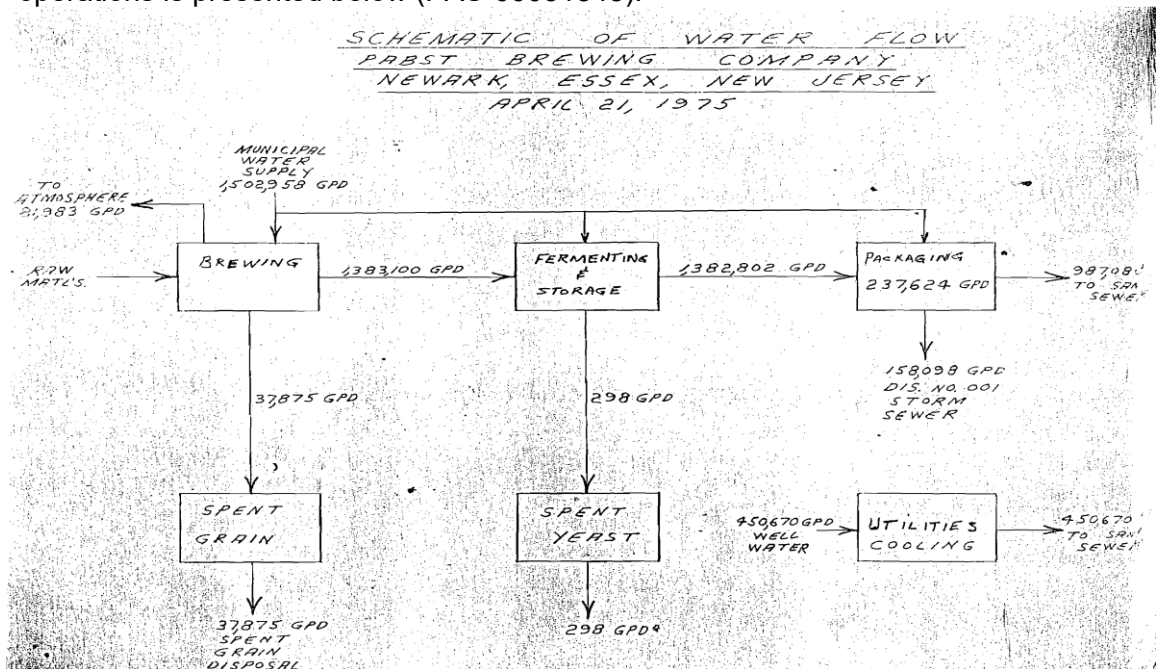
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The locations of the USTs are depicted below (PAP-00287097):



A schematic of how water was used and discharged by the facility as part of its operations is presented below (PAS-00031848):



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4. Identified COCs

- PCBs (detected)
- PAHs (detected)
- Copper (detected)
- Lead (detected)
- Mercury (detected)

PCBs

Nine USTs were present at the facility, containing No.6 heating oil, No.2 diesel fuel, and unleaded gasoline (PAS-00031922-23, 29). According to an *Underground Storage Tank Closure Summary Report*, dated March 1992, sand fill material exhibiting high petroleum odors was found inside Tanks E5, E7, and E8. Excavated soil from around those tanks also exhibited high petroleum odors. The excavated soil and sand fill material was stockpiled (Lot "D"). PCB Aroclor-1254 was detected at a maximum concentration of 2,560 parts per billion (ppb) in combined samples taken from the soil stockpile. (PAS-00031936, 56).

PAHs

Nine USTs were present at the facility, containing No.6 heating oil, No.2 diesel fuel, and unleaded gasoline (PAS-00031922-23, 29). According to an *Underground Storage Tank Closure Summary Report*, dated March 1992, and a *Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, prepared by EcolSciences, Inc., dated May 6, 2016, low and high molecular weight PAHs were detected in soil in the area of the USTs at the facility (PAP-00287067, 145-48; PAS-00031946). The *Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, dated May 6, 2016, states that the detections of PAHs were consistent with concentrations of PAHs identified in Historic Fill (PAP-00287067, 76).

Copper

According to a *Heavy Metals Source Determination Study*, prepared by PVSC, dated August 15, 1978, copper was detected in facility wastewater in 1978 at a concentration of 0.179 mg/L, or 2.344 pounds per day (PAS-00031647; PAS-00031832).

According to a 1984 Discharge Surveillance Report, Discharge 001 was required to be monitored for copper, with a discharge limit of 1.0 (no units were listed). The sample result was listed as 0.005 (no units were listed) (PAP-00406396).

Lead

According to a *Heavy Metals Source Determination Study*, prepared by PVSC, dated August 15, 1978, lead was detected in facility wastewater in 1978 at a concentration of 0.117 mg/L, or 1.532 pounds per day (PAS-00031647; PAS-00031832).

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Nine USTs were present at the facility, containing No.6 heating oil, No.2 diesel fuel, and unleaded gasoline (PAS-00031922-23, 29). According to an *Underground Storage Tank Closure Summary Report*, dated March 1992, lead was detected in soil associated with the USTs at the facility. Lead was detected at a maximum concentration of 12,000 ppb (PAS-00031918).

Mercury

Mercury was detected in facility wastewater effluent at concentrations up to 0.0063 [units were not available in the file, but it is assumed the concentrations are in milligrams per liter (mg/L)] (PAS-00031816-18).

According to a *Heavy Metals Source Determination Study*, prepared by PVSC, dated August 15, 1978, mercury was detected in facility wastewater in 1978 at a concentration of 0.0012 mg/L, or 0.0157 pounds per day (PAS-00031647; PAS-00031832).

Historic Fill

The Allocation Team has determined that the facility site is not located on regional Historic Fill as designated by the NJDEP.¹

The NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.² Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the United States Environmental Protection Agency (EPA) Target Compound List (TCL) for PAHs and Target Analyte List (TAL) for metals, including lead, copper, mercury, and the OU2 PAH COCs.³ PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.⁴

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00292425).

¹ *Historic Fill for New Jersey*, <https://www.nj.gov/dep/nigs/geodata/dgs04-7.htm>, Quadrangle No.52 & No.53 (NJDEP map identifying locations of recognized historic fill).

² *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

³ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

⁴ NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	610 mg/kg
Benzo(a)anthracene	7.633 mg/kg
Benzo(a)pyrene	5.94 mg/kg
Benzo(b)fluoranthene	9.733 mg/kg
Benzo(k)fluoranthene	3.82 mg/kg
Dibenzo(a,h)anthracene	0.546 mg/kg
Indeno(1,2,3-cd)pyrene	1.76 mg/kg

It is noted that according to a *Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, prepared by EcoSciences, Inc., dated May 6, 2016, the facility is underlain by "Urban Land" (i.e., Urban Fill). The original characteristics of the native soils at the site have been extensively reworked due to the long history of development in this area. Approximately five to ten feet of additional soil and construction type debris (up to twenty feet in certain areas) have also been placed on the site (PAP-00287062).

5. COC Pathways

Sanitary Sewer

The facility received a New Jersey Pollutant Discharge Elimination System (NJDPES) permit (No.NJ0028088) to discharge wastewater to the PVSC system on November 30, 1982 (PAS-00031712). This was designated as Discharge 002 (PAS-00031755). According to a *NJDEP Discharge Surveillance Report* dated April 3, 1985, wastewater discharged to Discharge 002 included water from wash down of vessels, piping, equipment, and sinks; and, non-contact cooling water for production equipment, air compressors, and air conditioning (PAS-00031757-58). The Clay Street CSO, which discharged to the Passaic River, was located approximately three miles from the facility, between the point at which the facility connected to the PVSC system and the PVSC treatment plant (PAS-00032016).

Documented wastewater discharge volumes are as follows:

- According to a *Waste Effluent Survey* dated June 6, 1972, 594,568,000 gallons of wastewater were discharged to the sanitary sewer, and 96,790,000 gallons of wastewater were discharged to the storm sewer in 1971 (PAS-00031804).
- According to a *Waste Effluent Survey* dated April 14, 1975, 440,507,570 gallons of wastewater were discharged to the sanitary sewer, and 49,484,560 gallons of wastewater were discharged to the storm sewer in 1974 (PAS-00031809).
- According to a *Heavy Metals Source Determination Study*, prepared by PVSC in 1978, wastewater discharge from the facility was 1.57 million gallons per day (MGD). The 1978 study also showed detection of mercury, copper and lead in facility wastewater (PAS-00031647).

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- In 1978, the facility reported that 401,467,017 gallons of wastewater were discharged to the sanitary sewer, and 106,215,100 gallons of wastewater were discharged to the storm sewer (PAS-00031828).
- According to an *NJDEP Public Notice* dated September 15, 1982, the facility discharged 1.44 MGD, and no pretreatment occurred (PAS-00031714).
- According to a 1983 Facility Wastewater Report, the facility discharged a maximum of 1.3422 MGD at Discharge 002 between February 1983 and April 1983 (PAP-00406403).
- In 1984, PVSC listed the average daily wastewater flow from the facility as 1.426 MGD (PAP-00016793).
- According to a 1985 Facility Wastewater Report, the facility discharged a maximum of 1.4594 MGD at Discharge 002 between February 1985 and April 1985 (PAP-00406602).

Storm Sewer

According to an undated EPA Fact Sheet for Draft NPDES Permit to Discharge into the Waters of the United States, non-contact cooling water was discharged through Discharge 001. The receiving water body was listed as Maybaum Creek (PAS-00031709-11). It appears Maybaum Creek may be connected to the Rahway River (PAS-00031749). Maybaum Creek is a tributary of the Rahway River, which discharges to the Atlantic Ocean (PAS-00031750). Average non-contact cooling water discharges were 0.158 MGD to Discharge 001 (PAS-00031709, 11; PAP-00406427).

According to a letter prepared by Pabst Brewing Company, dated May 22, 1981, the facility had been discharging cooling water into the South Orange Avenue storm sewer since 1964 at the suggestion of the City of Newark to avoid hydraulically overloading the sanitary sewer system. According to the letter, the storm sewer discharged to the Rahway River and the Atlantic Ocean (PAS-00031750).

Direct Release

There is no information regarding direct release in the available file material.

Spills

There is no information regarding spills in the available file material.

6. Regulatory History/Enforcement Actions

Inspections

There is no information regarding inspections in the available file material.

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Violations

Pabst and New West Developers, Inc. received Notices of Violation (NOV) on May 5, 2005 and April 28, 2011, for failure to conduct a remedial investigation and conduct remediation (PAP-00286348-49; PAP-00286135).

To address the May 5, 2005 NOV, New West Developers, Inc.'s consultant submitted a letter for NJDEP stating that remedial investigation activities would commence in August 2005 (PAP-00286599).

According to a *Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, prepared by EcolSciences, Inc., dated May 6, 2016, Pabst received two NOVs from the NJDEP dated April 28, 2011 and July 19, 2011 in a February 9, 2012 letter. The February 9, 2012 letter states that as a result of management reorganization at Pabst in 2010 and a change of address, the new management of Pabst did not immediately receive the 2011 NOVs. Therefore, Pabst's response to the NOVs was delayed. Upon receipt and review of the NOV's and discussions with the NJDEP, Pabst complied with the NOV and retained EcolSciences's Licensed Site Remediation Professional (LSRP) to oversee the investigation and remediation of the regulated USTs (PAP-00287061).

Permits

The facility first received a NPDES permit (No.NJ0028088) on May 1, 1976 (PAS-00031750).

The facility received a NPDES permit (No.NJ0028088) to discharge to Maybaum Creek on October 30, 1981 (PAS-00031722). Discharge 001 was required to be monitored quarterly for copper, with a discharge limit of 1.0 mg/L; however, the permit noted that monitoring for this parameter was not required unless a corrosion inhibitor containing this metal was used for water treatment purposes (PAP-00406523).

The facility received a NJDPES permit (No.NJ0028088) to discharge wastewater to the PVSC system on November 30, 1982 (PAS-00031712).

According to a 1984 Discharge Surveillance Report, Discharge 001 was required to be monitored for copper, with a discharge limit of 1.0 (no units were listed) (PAP-00406396).

A NJDEP memorandum, dated November 5, 1986, states it verified an Affidavit of Exemption from Pabst related to their NJPDES permit (No. NJ0028088), confirming that discharges has ceased (PAP-00406740). The NJPDES permit was cancelled in June 1986 (PAP-00406744).

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7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Underground Storage Tank Closure Summary Report*, dated March 1992 (PAP-00293902);
- *Remedial Investigation Report Addendum*, dated August 1995 (PAP-00293902);
- *Remedial Investigation Report/Remedial Investigation Workplan Addendum*, dated January 2000 (PAP-00293902);
- *Remedial Investigation Report/Remedial Action Workplan*, dated November 2002 (PAP-00293902);
- *Supplemental Remedial Investigation Report for Soils*, dated March 5, 2010 (PAP-00286143); and,
- *A Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, prepared by EcolSciences, Inc., dated May 6, 2016 (PAP-00287058).

Sewer

There is no information regarding sewer sampling data in the available file material.

Soil

Nine USTs were present at the facility, containing No.6 heating oil, No.2 diesel fuel, and unleaded gasoline (PAS-00031922-23, -29). According to an *Underground Storage Tank Closure Summary Report*, dated March 1992, lead and PAHs were detected in soil at the facility (PAS-00031918, 46). Lead was detected at a maximum concentration of 12,000 ppb (PAS-00031918). In addition, PCB Aroclor-1254 was detected at a maximum concentration of 2,560 ppb in combined samples taken from a soil stockpile associated with Tanks E5, E7, and E8 at the facility (PAS-00031956). The *Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, prepared by EcolSciences, Inc., dated May 6, 2016, also states that lead and PAHs were detected in soil at the facility. As discussed further below, according to the report, the detections of PAHs were consistent with concentrations of PAHs identified in Historic Fill (PAP-00287067, 76).

According to a letter to NJDEP prepared on behalf of New West Developers, Inc., dated July 17, 2008, requesting a determination of No Further Action for Soil, from 1994 to 2004 Pabst conducted a multi-phase Remedial Investigation of the various former tank areas. Based on the results of the investigation there were five tank areas where regulated compounds subject to remediation provisions remained in soil at that time (PAP-00286131).

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According to a *Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, prepared by EcolSciences, Inc., dated May 6, 2016, supplemental soil investigation in the Tank E1 through E4 area was needed to confirm that the PAH exceedances historically identified were associated with Historic Fill rather than former USTs. In every test pit conducted onsite by EcolSciences, fill material consisting of soil mixed with concrete, asphalt, demolition debris, and other household type material throughout the test pit depth (generally extending to at least ten to fifteen feet below grade). In many locations, test pits could not be completed to the native soils given the thickness of the Historic Fill and the overlying fill/construction debris. Based on these observations, EcolSciences concluded that the PAH concentrations identified in this area are the result of Historic Fill contamination and the remedial investigations for Tanks E1 through E4, as well as the remedial investigations for soil relative to all tank areas, were complete (PAP-00287076).

Groundwater

Based on the *Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, prepared by EcolSciences, Inc., dated May 6, 2016, groundwater data are not indicative of a plume containing OU2 COCs (PAP-00287098).

Remedial Activities

According to a *Remedial Investigation Status Report* (November 2002 – January 2003), prepared by ENSR Corporation, dated February 2003, nine USTs were removed or abandoned at the site in 1991/1992 (PAP-00293902). The *Underground Storage Tank Closure Summary Report*, dated March 1992, states that the USTs were closed under the oversight of NJDEP (PAP-00293457). According to the *Remedial Investigation, LNAPL IRM, and Groundwater Classification Exception Area Report for Regulated Underground Storage Tanks*, prepared by EcolSciences, Inc., dated May 6, 2016, one of the USTs received a “no further action” designation from NJDEP on January 3, 2001 (PAP-00287066); it is unclear if the remaining USTs have yet to receive “no further action” designations (PAP-00287053-55).

8. Summary of Asserted Defenses

Pabst asserts that Pabst is not liable under the CERCLA Third Party defense for heavy metals in its wastewater because the City of Newark provided all of Respondent’s water for use at the Facility. The Facility’s discharges to the PVSC system were federally permitted discharges with very limited deviations. COC releases related to underground storage tanks at the Facility are subject to the CERCLA petroleum exclusion.

There have never been any direct discharges of COCs from the Pabst Facility to the Passaic River. While the COCs lead, copper, and mercury have been identified on intermittent occasions in wastewater discharged from the Pabst Facility to the PVSC system, Pabst’s use of water from the City of Newark’s water system historically known

Pabst Brewing Co., LLC

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to contain copper and lead, along with Pabst's location almost 3 miles from the Clay Street CSO, makes it questionable that what is an extremely de minimis volume of COCs discharged from the Facility to the PVSC system would have made it 3 miles to the Clay Street CSO, into the Passaic River and settled into the sediment or is remain there today.

Records containing specific information regarding brewery operations are no longer available. The current owners of Pabst acquired the company in 2014 approximately 35 years after brewery operations ceased in 1985. In a 1997 response to a CERCLA Section 104(e) request concerning the Diamond Alkali Superfund Site, counsel for Pabst explained that "Pabst has no information or documentation at this time which is responsive in any fashion" to the Request. During a search for historic insurance information in 2013, it was disclosed that many of the records may have been destroyed by water damage.

Passaic Pioneer Properties Company

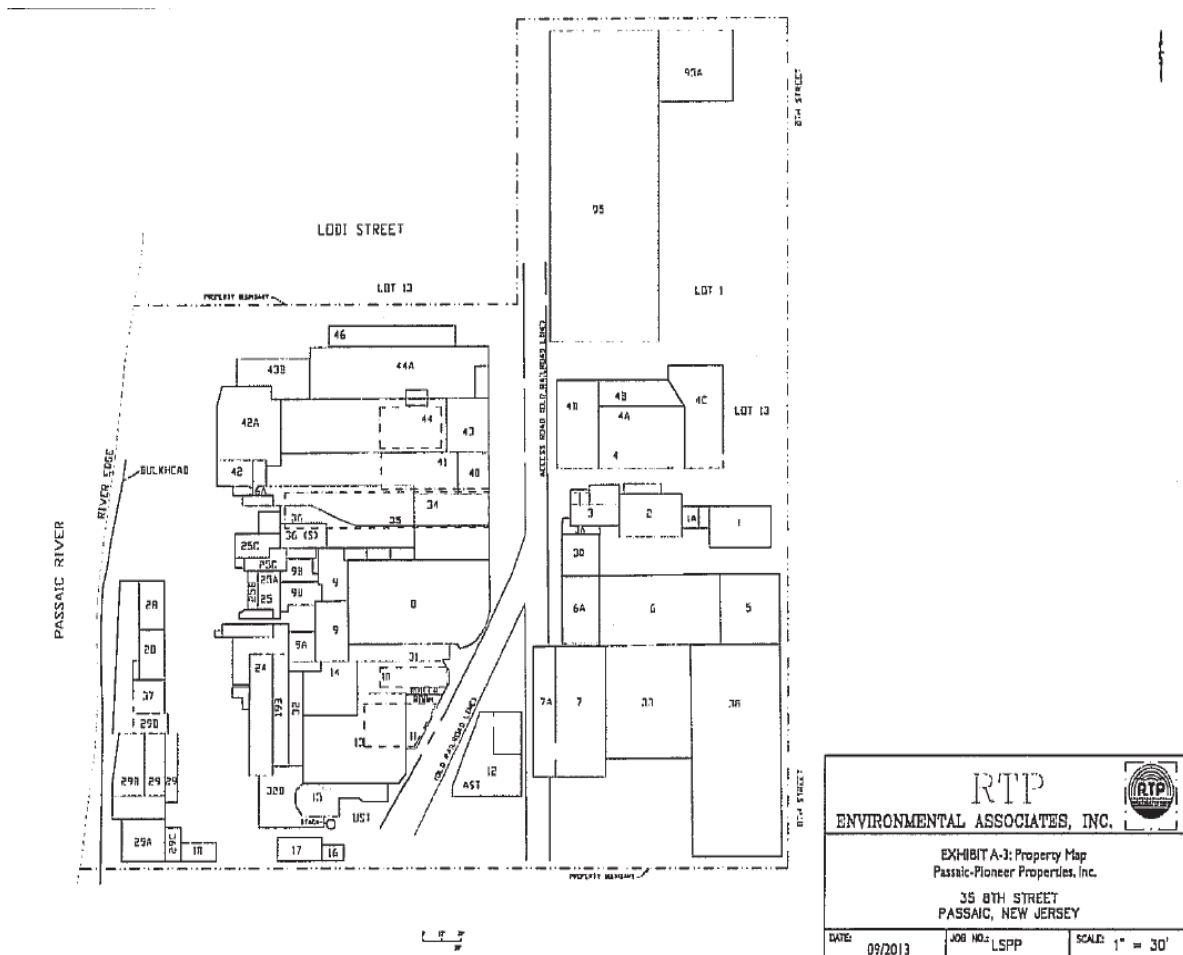
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PASSAIC PIONEER PROPERTIES COMPANY

Facility Name, Address and Size: Passaic Pioneer Properties Company (PPP), 35 Eighth Street, Passaic, NJ. 9.34 acres (PAS-00115127; PAP-00047948; PAP-00194128). The property consists of two lots on Block 1029, lots 1 and 13 (facility) (PAP-00194161). This was a multi-tenant industrial/manufacturing facility. Information regarding the number of employees and hours worked was not available in the documents reviewed for this report.

- 1. Business Type:** PPP was the property owner of a multi-tenant industrial building complex. There are five separate buildings at the subject property. The buildings are grouped as follows: Buildings 18, 28, 29 and 37 make up one building (contiguous and separated by walls only); Buildings 4, 4A, 4B, 4C, 4D are grouped to make up a building; Buildings 1, 2, 3, 5, 6, 7, 12, 30, 33, and 38 are grouped together; Building 95 is a standalone structure; and the remaining Building numbers make up the fifth building. Although there are separate building numbers, the majority of the buildings are contiguous and are separated by walls only (PAP-00193872) See the following schematic of property layout below.



(PAP-00047950)

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2. Time Period of Ownership/Operations

Operator: N/A

Owner: 1936/1966 to 2006

PPP owned the facility property from 1936 until February 2006 (PAP-00193845; PAP-00193848; PAS-00115312). More than fifty (50) tenants have leased buildings and other areas of the facility property from PPP for industrial, manufacturing, and storage operations during that period (PAP-00194148-50).

- The facility began operations in the late 1800s as an area of industrial and manufacturing operations.
- PPP purchased a large portion of the facility from Patterson Parchment Paper Company in 1936 and the remainder of the property in 1966 (PAP-00193868).
- PPP sold the property in February 2006 to Passaic Commercial Properties, LLC (the current owner).

3. Operational History/COC Use and Presence at the Facility

PPP leased buildings and land surface to tenants for the operation of industrial, manufacturing, and storage operations space from 1936 to 2006 (PAP-00193865-66).

The primary business type occupying the subject property since 1936 consisted of fabric dyeing, finishing, and knitting operations. This included the following companies:

- Inter-State Dyeing and Finishing (1936 to 2000)
- American Brand Textile Company (1954 to the late 1980s)
- Marijon Dyeing & Finishing Company (1954 to 1968)
- Regent Manufacturing (1959 to 1983)
- El & EF Meyer, Inc. (1958 to 1990)
- Sunbrite Dye Company (1965 to present)
- Baltic Dyeing & Finishing (1968 to 2001)

A variety of other business types leased the property as well, including:

- Applikay Textile Processing Corp., (1958 to 1985) which consisted of printing and finishing of textile materials
- Bal-Ray (1954 to 1958), which was also a printing company with operations similar to Applikay (PAP-00193868).
- Other types of businesses included woodworking, construction, and storage (PAP-00193873-74).

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Sunbrite Dye Company, Inc. (Sunbrite) is the largest tenant at the subject property. Sunbrite is the parent company to Ralon Textile Processing and East Coast Embossing, both operating on site in conjunction with Sunbrite. Sunbrite occupies Buildings 8, 9 (9, 9A, 9B), 14, 17, 18, 19B, 24, 24A, 25 (25, 25A, 25B, 25C), 28B, 28C, 29 (29, 29A, 29B, 29C, 29D), 31, 32, 32B, 34, 35, 36 (first and second floors), 36A, 37, 40, 41, 42, 42A, 43, and 44. Sunbrite also occupies Buildings 10 and 11, which are the boiler operations. Operations at Sunbrite primarily consist of dyeing, finishing, and drying of fabric material. Raw undyed material is placed in mesh bags which are closed and placed into dyeing machines. The bags containing the material are submerged in a dye bath consisting of water, steam, and aqueous-based dyes. Upon completion of dyeing the material, the mesh bags are removed from the dye bath and the dye bath was discharged into floor drains and troughs. Finishing of the dyed materials would include adding a starch-based material to the fabric prior to being dried through the frame (large capacity gas or steam dryers) (PAP-00193872).

Appendix 4 of a Hazardous Substances/Waste Inventory of a NJDEP *Site Remediation Program Preliminary Assessment Report*, dated April 14, 2006 (2006 NJDEP PAR) identifies hydraulic oil, paints, sealants, adhesives, and cutting oils as materials used by multiple PPP tenants (PAP-00193875-81). These substances can contain PCBs and lead. In addition, copper compounds were noted to be used by one tenant – Superior Dyeing Corporation (PAP-00193879). It also notes that none of the facilities on the property was identified as RCRA hazardous waste generators (PAP-00193881).

The 2006 NJDEP PAR also notes that Sanborn Fire Insurance Maps show that there was a 550-gallon naphthalene storage tank located at the western side of Building 28 (PAP- 00193885). In December 2000 and April 2008, ground-penetrating radar efforts were conducted to locate this underground storage tank (UST), neither of which showed the presence of an underground anomaly. Further, soil sampling confirmed that no COCs were detected in this location (PAP-00194174; PAP-00194211-12).

4. Identified COCs

- PCBs (possibly used and detected)
- PAHs (possibly used and detected)
- Copper (used and detected)
- Lead (detected)
- Mercury (detected)

PCBs

The 2014 *RIR/RAP* report notes that there were soil samples that identified “hot spots” of PCBs. The extent of contamination was delineated for the PCBs which showed very small areas, specifically along the rail line for the PCBs (PAP-00048067-74). PCB sampling, which was conducted in March 2011, was evaluated in accordance with the Soil Remediation Standard – Impact to Groundwater Guidance, SPLP for PCBs and the results were noted as non-detect (PAP-00048074). A second round of sampling was conducted in August 2011 specific to the PCB SPLP sample locations, and these results were also noted as non-detect (PAP-00048074). PCBs identified at the facility were

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attributed to non-indigenous historic fill, and therefore the proposed remedial action was an engineering control in the form of a cap for the facility in conjunction with a Deed Notice (PAP-00048082-83; PAP-00048087).

PAHs

According to the 2002 SI/RI Report, sampling conducted in November 2000 and May 2002 of the crawl space from four access points (A, B, C, and D) below Buildings 44 and 41, detected the following concentrations of PAHs.

November 2000 sampling event

- Benzo(a)anthracene 75,000 µg/kg and 35,000 µg/kg
- Benzo(a)pyrene 62,000 µg/kg and 38,000 µg/kg
- Benzo(b)fluoranthene 76,000 µg/kg and 43,000 µg/kg
- Benzo(k)fluoranthene 45,000 µg/kg and 41,000 µg/kg
- Chrysene 78,000 µg/kg and 40,000 µg/kg
- Dibenzo(a,h)anthracene 20,000 µg/kg
- Indeno(1,2,3-cd)pyrene 39,000 µg/kg and 23,000 µg/kg
(PAP-00193926-27; PAS-00115279-81).

The following PAHs were detected during the May 2002 sampling event

- Benzo(a)anthracene 46,000 µg/kg; 39,000 µg/kg; and 33,000 µg/kg
- Benzo(a)pyrene 47,000 µg/kg; 55,000 µg/kg; 20,000 µg/kg; and 1,200 µg/kg
- Benzo(b)fluoranthene 6,700 µg/kg; 97,000 µg/kg; 32,000 µg/kg; and 2,200 µg/kg
- Benzo(k)fluoranthene 12,000 µg/kg; 82,000 µg/kg; 32,000 µg/kg and 2,400 µg/kg
- Chrysene 60,000 µg/kg and 28,000 µg/kg
- Dibenzo(a,h)anthracene 6,600 µg/kg and 2,500 µg/kg
- Indeno(1,2,3-cd)pyrene 1,100 µg/kg; 1,100 µg/kg; and 4,500 mg/kg
(PAP-00193927; PAS-00115281).

These compounds were noted to be identical to those identified in the "Target Contaminant Concentrations of Typical Historical Fill Material" table in the Technical Requirements for Site Remediation (PAP-00193928). A third and fourth round of sampling in April and May 2003 only identified the following PAHs above the RDCSCC in one sample location:

- Benzo(a)pyrene 1,100 µg/kg;
- Benzo(b)fluoranthene 1,000 µg/kg.

(PAP-00194094-). As previously noted, this AOC was re-designated as AOC-5B (Building 44), AOC-5C (Building 35) and AOC-5D (Building 41) during a subsequent investigation (PAP-00194218-21).

One soil sample was collected in the crawl space under Building 44 (AOC-5B) in April 2008 and the results of this sample did not detect any contaminants above the most stringent remediation standards (PAP-00194189; PAP-00194435). Sampling below the concrete layer exhibited contaminants typical of historical fill only and a no further action determination was recommended for AOC-5B (PAP-00194457).

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A soil sample collected in 2008 beneath Building 41 (AOC-5D) detected benzo(a)anthracene (3.55 mg/kg), benzo(b)fluoranthene (3.21 mg/kg), benzo(a)pyrene (4.03 mg/kg), indeno(1,2,3-cd)pyrene (3.34 mg/kg), and dibenzo(a,h)anthracene (1.2 mg/kg). However, since the contaminants are consistent with those found in historical fill material, a no further action determination along with the institution of a deed notice was recommended, since the soils beneath the crawl space were already capped (PAP-00194459-60; 65-66).

Remedial investigation activities conducted in 2009 in the crawl space beneath Building 35 (AOC-5C) also detected PAHs and required further investigation. The crawl space was cleaned and in 2011 eight additional samples were taken. Analysis of the sampling concluded that the contaminants identified were not related to on-site operations and were instead consistent with those observed in historic fill material (PAP-00048081).

Copper

According to the 2002 SI/RI Report discussed above, copper was detected in two samples during the November 2000 sampling; 784 mg/kg and 647 mg/kg. Copper was detected in three of the four samples taken during the May 2002 sampling; 1,720 mg/kg, 1,730 mg/kg, and 628 mg/kg (PAP-00193926-28; PAS-00115279-82). These samples were part of the investigation of the crawl space below Buildings 44, 41 and 35, designated as AOC-1. The contaminants identified during these investigatory activities were determined to be identical to those identified in the "Target Contaminant Concentrations of Typical Historical Fill Material" table in the Technical Requirements for Site Remediation (PAS-00115279-82). A No Further Action Letter was recommended by RTP (PAS-00115261; PAP-00193909). The NJDEP required additional sampling beneath and/or outside of the area of the crawl space to verify the integrity of the sampling, which was documented in the 2003 Addendum to the SI/RIR (PAP-00194076-78; 93-95). Copper was identified under Building 44 during the 2003 sampling (2.08 mg/kg at 5.25-5.75 feet and 8.07 mg/kg at 6-6.5 feet bgs) (PAP-00194189); and was detected in sampling related to Building 41 (261 mg/kg at 5.25-5.75 feet and 351 mg/kg at 6-6.5 feet bgs) (PAP-00194191).

The following table shows the highest concentration of copper for Building 35 (AOC-1) for the subsequent sampling events in 2006, 2008, 2009 and 2011 as reported in the 2014 RIR/RAP.

Copper Concentrations		
Sample Year	Depth (bgs)	Results
2006	0.5-1 feet	999 mg/kg
2008	1-1.5 feet	279 mg/kg
2009	1.5-2 feet	173 mg/kg
2011	0.0-0.5 feet	98.5 mg/kg

(PAP-00048092)

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Lead

A November 2002 Site Investigation/Remedial Investigation Report (SI/RIR) for Inter-State Dyeing and Finishing Company detected lead in three of the four samples taken during November 2000 sampling; 608 mg/kg, 1,470 mg/kg, and 692 mg/kg. Lead was detected in four samples taken during May 2002 sampling; 1.260 mg/kg, 1,690 mg/kg, 4,430 mg/kg, and 425 mg/kg (PAP-00193926-28; PAS-00115279-82). These samples were part of the investigation of the crawl space below Buildings 44, 41 and 35, designated as AOC-1. The contaminants identified during these investigatory activities were determined to be identical to those identified in the "Target Contaminant Concentrations of Typical Historical Fill Material" table in the Technical Requirements for Site Remediation (PAS-00115279-82). A No Further Action Letter was recommended (PAP-00193909; PAS-00115261). The NJDEP required additional sampling beneath and/or outside of the area of the crawl space to verify the integrity of the sampling, which was documented in an Addendum to the SI/RIR (PAP-00194076-78; PAP-00194093-95). A third and fourth round of sampling in April and May 2003 showed that there was no direct contamination from the crawl space and good crawl space integrity, therefore, No Further Action was requested (PAP-00194095). This AOC remained active and was subject to further investigation as part of the Memorandum of Agreement between PPP and the NJDEP (PAP-00193826). Ultimately, the crawl spaces under these buildings were re-designated as AOC-5B (Building 44), AOC-5C (Building 35) and AOC-5D (Building 41) (PAP-00194218-21). AOC-5B and AOC-5D warranted No Further Action as of June 2009 (PAP-00048005-07). During the 2003 sampling, lead was not detected above the Residential Direct Contact Soil Cleanup Criteria ("RDCSCC") under Building 44 (PAP-00194189) and determined by RTP to be consistent with levels found in historic fill under Building 41 (PAP-00194190-92). The contaminants identified in AOC-5C were determined by RTP to be consistent with those observed in historic fill as of the RIR/RAR completed in May 2014 (PAP-00048081).

Additional sampling for the 2014 RIR/RAP revealed the presence of lead (along the railroad line ranging from 0.202 mg/kg to 2.8 mg/kg) greater than the NJSRS and IGWSSL. It was concluded these constituents were the result of historic fill and it was proposed to cap the entire facility with registering of a deed notice regarding site conditions (PAP-00048082).

Mercury

The 2014 RIR/RAP report notes that soil sampling was conducted and analyzed within the crawl space (sediment sample) and the crawl space exterior of Building 35, as requested by NJDEP. The contaminants detected were those noted as typical Historic Fill (PAP-00048079-83; 104). The report includes sampling information showing that the maximum concentration of mercury noted above (642 mg/kg) a crawl space soil sample (CS-5) during 2006 (PAP-00048098). During the same sampling event, 35.1 mg/kg of mercury were detected in another crawl space sample (CS-4). Both of these samples were in Building 11 Boiler Room, and designates as AOC-5A (PAP-00048066, 104).

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These soil samples were further evaluated in accordance with the Soil Remediation Standard – Impact to Groundwater Guidance as using the Synthetic Precipitation Leaching Procedure (“SPLP”) sampling method, and all results were noted as non-detect (PAP-00048073-74). The remedial outcome for this AOC was recommendation of no further action with engineering controls (PAP-001994431-33, 454-456).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.¹

NJDEP has established that historic fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.² Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.³ PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.⁴

The levels of lead, PCBs, and PAHs detected on the facility site do not exceed the maximum concentrations levels of contamination considered by NJDEP to be typical of that found in Historic Fill. Mercury and copper levels significantly exceed Historic Fill maximum concentrations.

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAP-00047953-55).

¹ *Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, <https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm>, Quadrangle No. 52 and No. 42 (NJDEP map identifying locations of recognized historic fill).

² *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

³ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

⁴ NJDEP Table 4-2 (PAHs and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	8,830 mg/kg
Copper	1,730 mg/kg
Mercury	642 mg/kg
Benzo(a)anthracene	20 mg/kg
Benzo(a)pyrene	13.1 mg/kg
Benzo(b)fluoranthene	11.3 mg/kg
Benzo(k)fluoranthene	9.56 mg/kg
Dibenzo(a,h)anthracene	2.61 mg/kg
Indeno(1,2,3-cd)pyrene	7.99 mg/kg

(PAP-00047954, PAP-00115281)

A Deed Notice with Engineering Controls was issued October 18, 2013, subject to benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, arsenic, lead, mercury, and PCBs. An attachment to the 2013 Deed Notice states that the only contaminants identified at the subject property are those contained in Historic Fill. Nonindigenous fill material consisting of grey to black soil (coal dust), coal fragments with some crushed brick, gravel, wood, and glass was identified in some areas of the property from zero to approximately nine feet below grade (PAP-00047937). The remedial action for the facility is an engineering control in the form of a cap for the site in conjunction with the deed notice (PAP-00048087).

5. COC Pathways

Sanitary and Storm Sewer

According to the 2006 Preliminary Report (PAR), all sanitary and industrial waste generated at the PPP property is discharged to the public sanitary sewer system and treated at the PVSC treatment plant located in Newark, New Jersey. According to the Passaic City Engineering Department, the subject property has been hooked up to the public sanitary sewer system since prior to 1900 (PAP-00193883). Per the 2006 PAR, tenant, Sunbrite Dye Company was issued a Sewer Use Permit by the PVSC for process wastes. Channels and floor drains were observed in the Sunbrite tenant area, predominately in the dyeing locations. The dye bath discharged to the channels and floor drains, which then discharged to reclamation tanks located in Building 14. The reclamation tanks temporarily stored process waste for the dyeing operations. Monitoring of the pH was conducted and adjusted to permitted levels before discharge to the sanitary sewer. Three former tenants, Superior Dyeing Corporation, Baltic Dyeing & Finishing Company, and Inter-State Dyeing & Finishing had similar Sewer Use Permits from PVSC. Their operations also utilized channels and floor drains that discharged to reclamation tanks for pH adjustment prior to discharging the process waste to the sanitary sewer system (PAP-00193883).

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The Direct Discharge PRP Cases for the Lower Passaic River Study Area pertaining to PPP notes historical violations from PVSC. The discharges were noted generally as "dye waste". Dye waste has not been documented to contain any of the COCs (PAS-00115134-39).

The 2002 SI/RI stated that water in the crawl space beneath Buildings 35, 41, and 44 had been present on numerous occasions over the years and on a regular basis, predominately after periods of rainfall, the water was pumped out and discharged to the sanitary sewer. During a second round of SI activities conducted in May 2002, it was noted that roof leaders discharged to the crawl space. Based on the three observations made of the crawl space, it was determined that the likely source of the water found in the crawl space was from storm water, surface water runoff, and on occasion floodwater from the adjacent Passaic River (PAP-00193926-28).

The 2006 NJDEP PAR for the PPP Property notes that there have been above-ground storage tanks, underground storage tanks, piping, aboveground and belowground pumping stations, sumps, pits and storage pads including drum and/or waste storage at the facility. It notes the existence of floor drains, trenches and piping, and sumps at the facility. The local surface water body is identified as the Passaic River. Other areas of concern are noted to be transformers, hazardous material storage and handling areas, discolored or spill areas, non-contact cooling water discharges from a boiler room, and areas which receive flood or storm water from potentially contaminated areas (PAP-00193852-53).

According to the 2006 NJDEP PAR, the Passaic River is located directly adjacent to the west of the subject property. Based on mapping of flood zones and wetlands, the subject property and direct vicinity are applicable to flood zoning (100-year flood zone). According to the PAR, it was reported that the Property had been subject to flooding in the past, most recently September 1999. Reportedly, no process waste was ever discharged to the Passaic River, nor was the river used as a source of process water. Sampling of the Passaic River was not proposed relative to the facility (PAP-00193888).

According to a 2008 Baseline Ecological Evaluation for PPP, a metal bulkhead exists between the Passaic River and the facility property on the western boundary of the facility (PAP-00194174,210-11, 308). The date this bulkhead was installed was not specified.

6. Regulatory History/Enforcement Actions

Permits

Sunbrite Dye Company

NJPDES Permit No. 157157 belonged to the tenant Sunbrite Dye Company. The NJPDES permit is a General Permit for storm water discharge. The facility did not receive any violations from the NJDEP regarding this stormwater discharge permit (PAP-00194147).

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Sunbrite Dye Company was also issued a Sewer Use Permit by PVSC for process wastes, which predominantly included spent dye materials from the dyeing operations. Channels and floor drains were apparent in the Sunbrite tenant area, predominantly in the dyeing locations. The dye bath discharged to the channels and floor drains, which then discharged to reclamation tanks located in Building 14. The reclamation tanks are temporary storage of process waste for the dyeing operations. Monitoring of pH was conducted, and adjusted to permitted levels before discharge to the sanitary sewer system (PAP-00193883).

Superior Dyeing Corporation

NJPDES Permit No. 157274 belonged to a former tenant Superior Dyeing Corporation. Superior Dyeing Corporation filed for bankruptcy and is no longer in existence. Specific information regarding this permit is not available. Superior Dyeing Corporation was subject to ISRA and received a No Further Action letter from the NJDEP on February 22, 2005. This permit was identified as part of that ISRA Case No. 20030290 (PAP-00194147).

Superior Dyeing Corporation also had a PVSC Sewer Use Permit and its operations also utilized channels and floor drains in the dyeing locations in which the dye bath was discharged to reclamation tanks for pH adjustment prior to discharging the process waste to the sanitary sewer system (PAP-00193883).

Inter-State Dyeing and Finishing Company

Inter-State Dyeing and Finishing Company was issued a Sewer Use Permit by the PVSC. Permit number No. 26400150 was issued June 16, 1996 with an expiration date of June 2000 (PAS-00115131; PAS-00115134). Inter-State Dyeing and Finishing Company operations also utilized channels and floor drains in the dyeing locations in which the dye bath was discharged to reclamation tanks for pH adjustment prior to discharging the process waste to the sanitary sewer system (PAP-00193883).

Baltic Dyeing and Finishing

Baltic Dyeing and Finishing Company also had a PVSC Sewer Use Permit and its operations also utilized channels and floor drains in the dyeing locations in which the dye bath was discharged to reclamation tanks for pH adjustment prior to discharging the process waste to the sanitary sewer system (PAP-00193883).

Violations

Some tenants had PVSC permits as well as NJDEP permits for storm water discharge to the Passaic River. Although there were documented instances of dye wastes being released to the Passaic River, there is no information in available documents that stated these wastes contained COCs (PAS-00115415-426).

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A *PVSC Stream Contamination Report*, dated August 25, 1947 (PAS-00115125) states that on July 14, 1947, dye waste was observed discharging into the Passaic River through the storm sewer at Eclipse Piece Dye Works, a tenant at PPP. The inspector had found that the sewer system in this group of properties was in need of repairs. The tenant was noted to have made some emergency repairs, which eliminated the violation temporarily (PAS-00115396). A *PVSC Stream Contamination Report*, dated November 17, 1947, states that on October 22, 1947 (PAS-00115125), dye wastes were observed discharging into the Passaic River from PPP. A small leak in the sanitary sewer was identified under the mill buildings (PAS-00115398).

A *PVSC Stream Contamination Report*, dated January 13, 1948 (PAS-00115125), states that on November 15, 1947, dye waste was observed discharging into the Passaic River from PPP by way of a storm drain. Investigations revealed a broken pipeline from the plant of a tenant, Millbank, Inc., Textile Printers. The break was repaired and the violation eliminated (PAS-00115400).

An October 1951 letter states that there were intermittent discharges of industrial waste to the Passaic River from the PPP property. The letter notes that recollection of the original dual drainage system as put in by the previous owners (Paterson Parchment Paper Company), a single process concern, leaves the present explanation of heavy trucks frequently breaking the plant sewers underground insufficient to account for the intermittent pollution. The old dual drainage system from a single process appears to have been utilized to take care of a number of industrial wastes from various processes in a multiple tenant mill, and the careful separation of clean and dirty wastes seems to have become lost (PAS-00035373).

A *PVSC Weekly Summary of Inspections* by Inspectors from January 1952 states that daily inspections have not revealed any discharges of dye waste since some of the outlets to the Passaic River were blocked up the previous month. The weekly summary stated that the cessation of discharge could also be contributed to the shutting down of one of the tenant dyeing concerns. Work on the plumbing underneath the buildings was delayed due to weather but efforts were being continued (PAS-00035374).

A *PVSC Weekly Summary of Inspections* by Inspectors from January 1956 states that red-colored fluid was observed discharging from a 6-inch pipe into the river on the Inter-State Dyeing and Finishing Company property (PAS-00115406).

A *PVSC Memorandum*, dated March 31, 1970, states that PPP was an industrial terminal of approximately 46 buildings. A discharge of supposed cooling water into the Passaic River was observed between December 3, 1969 and December 17, 1969, which was sampled and found to be polluting. The constituents of the pollution were not noted, but it did state that one of the firms had boiler blow-down water connected, together with cooling water into a line and it was the boiler blow-down water that contained the compounds that were polluting the river. Upon being informed of the situation, the company had the boiler blow-down line disconnected from the river discharge and reconnected to a pipe leading to the sanitary sewer (PAS-00006216-17).

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A 1971 *Violations and Eliminations Report*, states that in December 1971, Parra Print at the PPP complex had one of its outlets sampled. The results showed pollution from this company. The constituents of the pollution were not specified. An inspector found that polluting material was discharging from a 1-inch pipe to the Passaic River. The plant manager was informed and he immediately arranged to plug the line with concrete and discharge the material to the sanitary sewer. This was completed by December 10, 1971 (PAS-00115411).

A PVSC *Stream Contamination Report*, dated December 7, 1978, states that a multi colored dye was observed discharging to the Passaic River from Inter-State Dyeing and Finishing. It should be noted that analysis of samples did not include specific chemicals (PAS-00115416-21).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- Site Investigation/Remedial Investigation Report for Inter-State Dyeing and Finishing Company, dated November 2002 (PAP-00193904)
- Addendum to the Site Investigation / Remedial Investigation Report for Inter-State Dyeing and Finishing Company, dated July 2003 (PAP-00194073)
- NJDEP Site Remediation Program, Preliminary Assessment Report for Passaic Pioneer Properties Company, dated April 4, 2006 (PAP-00193844)
- Addendum to the Preliminary Assessment Report for Passaic Pioneer Properties Company, dated January 10, 2007 (PAP-00194120)
- Revised Addendum to the Preliminary Assessment Report for Passaic Pioneer Properties Company, dated May 3, 2007 (PAP-00194124)
- Remedial Investigation Report, Remedial Action Workplan for Passaic Pioneer Properties Company, dated August 2008 (PAP-00194155)
- Addendum to the Remedial Investigation Report, Remedial Action Workplan for Passaic Pioneer Properties Company, dated January 2009 (PAP-00194325)
- Remedial Investigation Workplan for Passaic Pioneer Properties Company, dated May 8, 2009 (approved June 22, 2009) (PAP-00048000)
- Remedial Investigation Report, Remedial Action Workplan for Passaic Pioneer Properties Company, dated October 23, 2009 (PAP-00194412)
- Remedial Investigation Report/Remedial Action Report, dated May 2014 (PAP-00048061)

The 2002 *SI/RI Report*, dated November 2002, for the Inter-State Dyeing and Finishing Company prepared for PPP states that Inter-State was a tenant from 1936 until May 2000 when the company filed for bankruptcy and ceased operations. Two potential AOCs were investigated—crawl space/areas and historical fill. Sediment sampling in the crawl space showed that PAHs, copper and lead were detected above the Residential Direct Contact Soil Cleanup Criteria. Based on the results of the SI/RI activities

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conducted at the subject facility, No Further Action was requested. The report noted that although soil sampling from within the crawl space showed base neutral and metal contamination, it is unlikely that any water or soil/sediment materials would egress to the environment below the crawl space flooring. Any water pumped out from the crawl space is discharged to the sanitary sewer. Any soil will remain in the crawl space due to the concrete flooring and wall with the impermeable layer (PAP-00193908-19).

According to the 2006 *NJDEP PAR*, various areas of the property reportedly utilized fill material, specifically in areas adjacent to the Passaic River bank. Exact locations could not be determined, and it was assumed, based on conversations with the property owner, that there is the potential for the fill to be coal ash (PAP-00193889).

In addition, the report notes that an extensive file review of surrounding properties was conducted at the NJDEP in March 2002 and that many of the facilities reviewed have encountered historical fill. The properties with noted historical fill as well as base neutral and metal contamination include 100 Eighth Street, Lodi & Eighth Street, and 27 Eighth Street, all properties directly adjacent to the facility and subject property, indicating a regional problem. It was anticipated that additional investigations would be conducted regarding the fill material (PAP-00193889).

The 2006 NJDEP PAR for the entire property identified 52 AOCs (four of which were administrative and not contaminant based). Of these, AOCs 23 were No Further Actions and 29 were investigated further between 2003 and 2008. PAHs, PCBs and metals (including copper, mercury and lead) were detected, but all of these AOCs, with the exception of two, were also deemed to require No Further Action. These two areas were the crawl spaces under the buildings at Inter-State Dyeing and Finishing and the potential Historic Fill on the property (PAP-00193845; PAP-00048065-68; PAP-00194167). The report notes that information in the report was from inspections at the property in 2000, 2001, 2002, 2003 and 2006 (PAP-00193861). The crawl space was noted to be an area that received storm water and surface runoff. Soil sampling results of this crawl space showed base neutral and priority pollutant metal contaminants, identical to those identified in the "Target Contaminant Concentrations of Typical Historical Fill Material" table in the Technical Requirements for Site Remediation. Although the soil samples were not obtained from points with direct access to the environment, it was concluded that the soil (sediment) found in the crawl space is the result of years of storm water, as well as surface runoff from the facility and floodwaters from the adjacent Passaic River (PAP-00193886-87).

Appendix 7 – Aerial Photograph Review of the 2006 NJDEP PAR Report, states that in April 1973 aerial photography, Building 95 is apparent at the northeastern portion of the parking area. An additional building group (Buildings 28, 29 and 37) was constructed along the river's edge of the property. It appears that this area had been filled to accommodate the new buildings (PAP-00193891, 93). Only this area is not reported to have an impact of COC contamination, as only low levels of PAHs were detected in sampling in this area (between 0.274 and 0.667 mg/kg benzo(a)pyrene and 0.621 benzo(a)anthracene) (PAP-00048704; PAP-00048104). It also notes that there was no evidence of above ground storage tanks, waste dumping or burial pits, ponds, lagoons, or landfills in aerial photographs of the facility (PAP-00193893).

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A 2008 *Remedial Investigation Report, Remedial Action Workplan* states that additional sampling conducted at the request of the NJDEP adjacent to the crawl spaces confirmed the presence of contaminants below the New Jersey Soil Remediation Standards (“NJSRS”) and at levels much lower than those found in the crawl spaces, indicating no direct contamination from the crawl spaces and good crawl space integrity (PAP-00194217-18; PAP-00194433-39).

A May 2014, *RIR/RAP* states that PPP initially started site investigations and remediation as part of its ISRA compliance and obligation. The initial ISRA Case was for tenant, Inter-State Dyeing & Finishing Company, due to its cessation of operations, and it was given the ISRA Case No. E20000341. As stated above, site investigations were conducted at the Inter-State Dyeing & Finishing Company portion of the subject property in November 2002 and July 2003. Soil sampling was conducted and analyzed within the crawl space (sediment sample) and the crawl space exterior, as requested by NJDEP. The contaminants detected were those noted as typical Historic Fill. The Inter-State Dyeing & Finishing Company case was currently active at that time. In addition, two former tenant spaces received No Further Action determinations from the NJDEP; they are Superior Dyeing Corporation (ISRA Case No. E20030290) and Baltic Dyeing and Finishing Company (ISRA Case No. E20010450). Both of these tenants were fabric dyeing and finishing companies, similar to one of the current tenants on-site, Sunbrite Dye Company. The report includes sampling information showing that the maximum concentration of mercury noted above (642 mg/kg) was detected in crawl space soil sample (CS-5) during 2006. During the same sampling event, 35.1 mg/kg of mercury were detected in another crawl space sample (CS-4). Both of these samples were in Building 11 (PAP-00048061, 64-74, 79-83, 98, 104).

In addition, multiple General Information Notifications (GINs) were submitted to the NJDEP for the various current and past ISRA applicable tenants. Ultimately, PPP entered into a Memorandum of Agreement and Remediation Agreement with NJDEP, which combined all of the tenant areas into a single ISRA case, effective March 20, 2006 (PAP-00048065; PAP-00193827-43). PPP sold the property in February 2006 to Passaic Commercial Properties, LLC (the current owner), and ceased doing business. Starting with the ISRA Case for the Inter-State Dyeing & Finishing Company and continuing through the Memorandum of Agreement and Remediation Agreement, the ISRA Case Number for the subject property is E20000341. A Response Action Outcome was issued for the entire facility on January 5, 2015, with a Remedial Action Permit for Soils issued on October 6, 2014 (PAP-00047930-63; PAP-00047969-71).

The 2014 *RIR/RAP* report also notes that soil sampling to identify the presence of Historic Fill was conducted throughout the property in 2009. Soil logs identified soils throughout the facility consisting of grey to black non-indigenous soils starting from directly below the asphalt cover and ranging from a depth of two feet to nine feet. The area with the low range of depth was located directly adjacent to the Passaic River at the southwestern boundary of the facility. The area with the higher range of depth was also located adjacent to the Passaic River at the northwestern boundary of the facility. Soil sample results identified contaminants as target contaminants of typical Historic Fill. In addition, there were soil samples that identified “hot spots” of PCBs and mercury. The extent of contamination was delineated for the PCBs and mercury, which showed very

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small areas, specifically along the rail line for the PCBs and within the boiler room crawl space for the mercury (PAP-00048067-74).

Based on the remedial investigation activities conducted in 2009, further investigations were warranted for AOC 5C – Crawl Space – Building 35. It was initially proposed to remove the accumulated sediment within this crawl space area and then to institute a deed notice for the Historic Fill compounds detected below the crawl space (PAP-00048069).

In addition, only one AOC warranted a Remedial Action Workplan; Historic Fill (AOC 11). While certain AOCs exhibited contaminant concentrations greater than the current New Jersey Site Remediation Standards (NJSRS), the contaminants identified were not specific to the AOC, but specific to target compounds identified in Historic Fill (PAP-00048069).

Additional sampling revealed the presence of lead, mercury and PCBs greater than the NJSRS and IGWSSL. It was concluded these constituents were the result of historic fill and it was proposed to cap the entire facility with registering of a deed notice regarding site conditions (PAP-00048079-83).

According to the 2014 RIR/RAP report, soil Sampling and Synthetic Precipitation Leaching Procedure (SPLP) sampling showed that there was no impact to groundwater concerning any of the COCs identified in Historic Fill at the facility. Furthermore, taking guidance from the NJDEP's *Guidance from the Evaluation of Immobile Chemicals for the Impact to Ground Water Pathway (June 2008)*, those samples that were greater than the Impact to Ground Water Screening Levels and greater than two feet from ground water, were considered not likely to have impact to ground water (PAP-00048070-74; PAP-00048079-83; PAP-00048094; PAP-00048554-57; PAP-00048652-79).

Remedial Activities

The following engineering and institutional controls were completed on the facility site in three phases: July 2012, April 2013, and July 2013:

- Asphalt Cap: Building exterior – 6 inches (four inches of asphalt underlain by two inches of compacted gravel subgrade) ;
- Concrete Cap: Building interior – 8 inches (four inches of concrete underlain by four inches of dense grade aggregate); and
- Crawl Space: Locked and Signage.

(PAP-00048087-88; PAP-00048105 (Figure 4 – Capping Plan); PAP-00048680-85 (Attachment H – Photographs – Remedial Action); PAP-00048686-713 (Attachment I – Deed Notice)).

8. Summary of Asserted Defenses

No legal defenses were identified in the available file materials.

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PHARMACIA LLC

Facility Name, Address and Size: The Monsanto Company Site/The Monsanto Site/Kearny, New Jersey Plant/26-Acre Former Monsanto Property; Foot of Pennsylvania Avenue/1 Pennsylvania Avenue/8 Pennsylvania Avenue, Kearny, New Jersey; 26 acres; 100 employees, 7 days per week, three shifts per day (PAS-00003876).

1. **Business Type:** Manufacturing of detergent additives and phosphorus-based products (PAS-00073343).

2. **Time Period of Ownership/Operations**

Operator: 1955 to 1991

Owner: 1954 to 1994

1954: Monsanto Company (Monsanto) constructed its Kearny, New Jersey plant in 1954. The site served as a railyard prior to Monsanto's purchase in 1954 (PAS-00073343).

1955: Process operations began in 1955 (PAS-00073344).

1988: According to a *Site Evaluation Submission*, dated October 25, 1991, approximately 8 acres of the eastern portion of the property were leased to American Presidential Intermodal Company (PAS-00073453, 84, 89).

1991: Process operations were terminated in 1991 (PAS-00073344).

1992: The process areas were demolished in 1992 (PAS-00073344).

1994: Monsanto sold the property to the Motor Carriers Service Corp. in December 1994 (PAS-00073437).

1997: According to a letter prepared by legal counsel for Pharmacia Corporation (Pharmacia), dated March 26, 2004, in 1997, pursuant to a Distribution Agreement, Monsanto (known at the time of the letter as Pharmacia, as discussed below) spun off its chemical business into a separate company, Solutia Inc. (Solutia). As part of this transaction, assets and liabilities associated with the historical chemical business were transferred to Solutia. The letter states that, "generally speaking," responsibilities associated with the former manufacturing facility in Kearny, New Jersey, were among the liabilities transferred to and directly assumed by Solutia (PAS-00121816, 19). Solutia is a publicly held corporation with no corporate parent (PAS-00081751).

2000: According to a November 26, 2003 letter, the corporate entity that was known as Monsanto prior to March 31, 2000, is now called Pharmacia as a result of a name change filed on that date. In 2000, Pharmacia offered a portion of its ownership interest in Monsanto to the public (PAS-00081751).

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- 2002: According to a November 26, 2003 letter, in 2002, Pharmacia distributed the rest of its ownership interest in Monsanto to its shareholders. Consequently, Monsanto is now a publicly-held corporation with no corporate parent and has no direct connection to the site (PAS-00081751).
- 2003: The March 26, 2004 letter, on December 17, 2003, Solutia and 14 of its United States subsidiaries filed for bankruptcy protection and reorganization under Chapter 11 of the United States Code, in the United States Bankruptcy Court for the Southern District of New York. Solutia has taken the position that the bankruptcy filing relieves Solutia of its obligations under the 1997 Distribution Agreement, which include all obligations associated with the Kearny site (PAS-00121816-17).

3. Operational History/COC Use and Presence at the Facility

A letter prepared by Roux Associates, Inc. (Roux) on behalf of Monsanto, dated March 1, 1996 (March 1, 1996 letter), states that during Monsanto's ownership, the plant primarily manufactured detergent additives used in home laundry and phosphorus-based products used in a variety of consumer applications (PAS-00073343). The site manufactured phosphoric acid and sodium tripolyphosphate from 1955 until 1985. The manufacturing of Sterox® (ethoxylated alkylphenol) began in 1956 and ended in 1990. Alkylphenol (AP) was manufactured on site from 1960 to 1991 (PAS-00073344).

According to a *Remedial Investigation Work Plan*, dated December 18, 1989, phosphoric acid, sodium tripolyphosphate, "Sterox®," and AP were manufactured as follows:

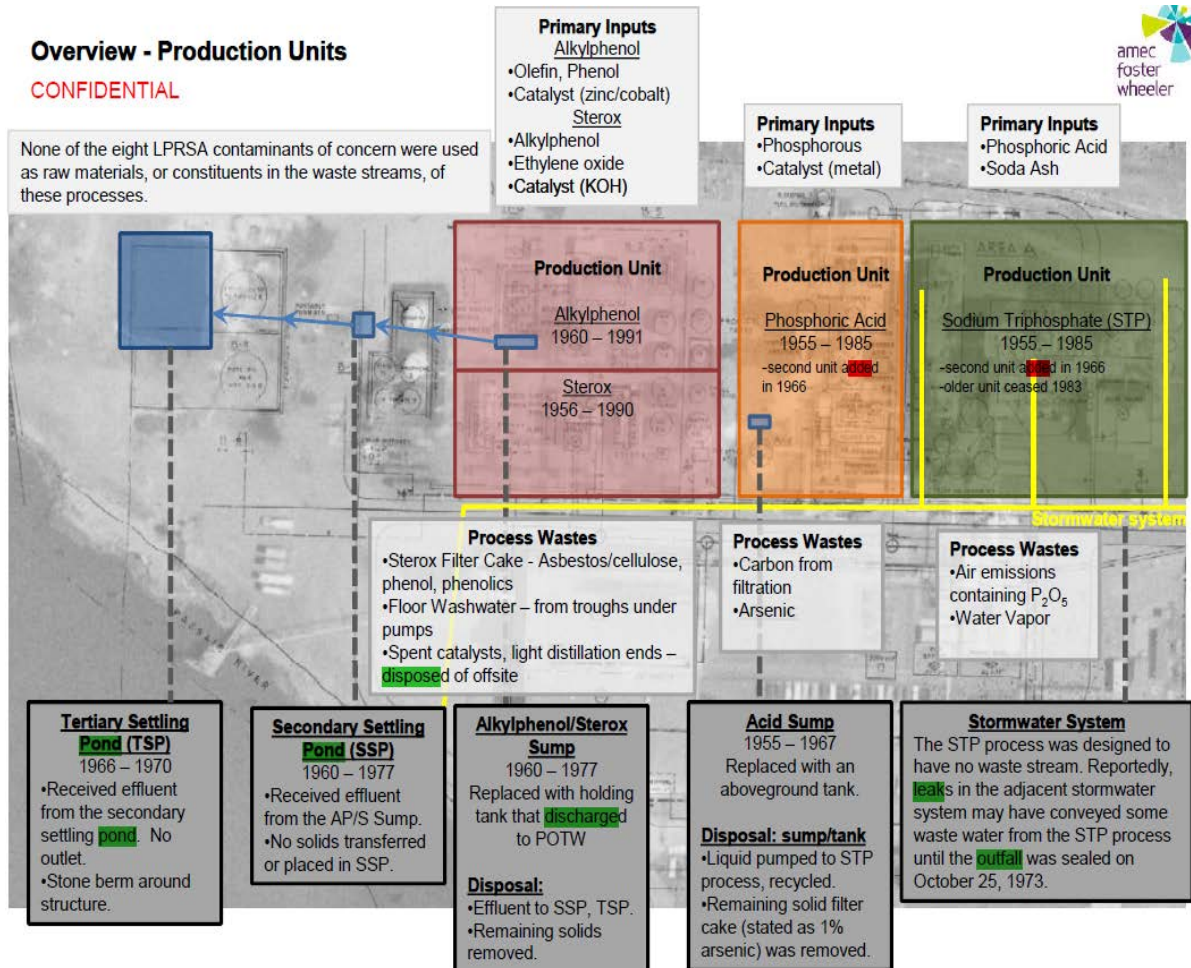
- To manufacture phosphoric acid, phosphorous was received by railroad tank cars and unloaded into storage tanks using water displacement. From the storage tanks, phosphorous was pumped to the top of a burning tower and oxidized with air to form phosphorous pentoxide gas. The hot phosphorous pentoxide gas would pass through the bottom of the tower into a hydrator and absorber. Weak phosphoric acid was sprayed into the hydrator to cool the hot gases which then continued toward the absorber. In cooling the gases, the dilute acid was concentrated by evaporation (PAP-00035278).
- The sodium tripolyphosphate process consisted of continuously mixing soda ash and phosphoric acid in varying proportions, drying and calcining the mixture, and grinding the dried solids to produce sodium tripolyphosphate (PAP-00035278).
- Various Sterox formulations were manufactured by reacting an AP with ethylene oxide in the presence of potassium hydroxide as a catalyst. The three basic process steps were reaction, neutralization, and filtration (PAP-00035283).
- APs were manufactured by reacting an olefin with phenol in the presence of a catalyst. The three basic process steps were catalyst activation, alkylation, followed by distillation (PAP-00035280).

Pharmacia LLC

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A diagram depicting the process inputs and wastes for each production unit is presented below (PAP-00036352):



In addition to home laundry and phosphorus-based products, according to the March 1, 1996 letter, vinyl siding was produced between 1967 and 1970. Monsanto imported polyvinyl chloride (PVC) pellets which were then shredded and used in the production of the vinyl siding during controlled extrusion processes (PAS-00073346).

The majority of files reviewed state that, with the exception of PCBs used for non-contact heat-transfer fluid in production equipment (as discussed below) and use of fuel oil (No. 4 and No. 6), COCs were not used or handled in production processes (PAS-00073430, 84-93, 98-99). However, the following potential exceptions were identified in the file material:

- According to an *Environmental Assessment*, dated December 1, 1982, “major” raw materials used at the site included copper sulfate (PAP-00035075). The report provides no details on how it was used or handled, and it is noted that reference to use of copper sulfate is not identified in other files reviewed.

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- In addition, according to a civil complaint filed by the New Jersey Department of Environmental Protection (NJDEP) against Monsanto on November 1, 1988, Monsanto used naphthalene in its operations (PAP-00212793-94). The document provides no details on how it was used or handled, and it is noted that reference to use of naphthalene is not identified in other files reviewed.
- Finally, according to a *Site Evaluation Submission*, dated October 25, 1991, one to ten pounds of mercury in a glass bottle was present in the maintenance shop (PAS-00073501).

It is also noted that according to the March 1, 1996 letter, the Kearny plant only served as a distribution point for maleic anhydride, and that this material was not used as a raw material or produced at the plant. It states that an assertion by Maxus Energy Corporation that maleic anhydride is a "dioxin precursor" is incorrect, and that maleic anhydride converts to maleic acid upon contact with water (PAS-00073346).

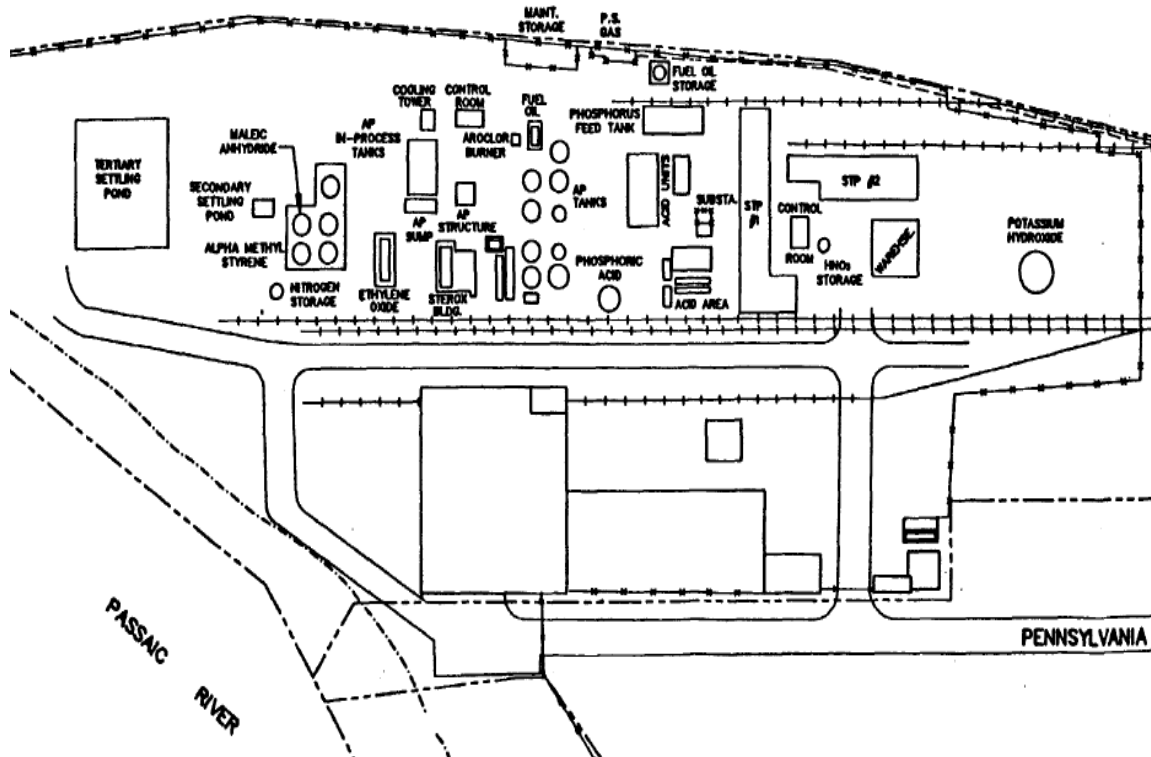
According to the March 1, 1996 letter, PCBs were used at the site from 1960 to 1972 as a non-contact heat-transfer fluid in production equipment (PAS-00073344). The PCB-containing heat-transfer fluid consisted of Aroclor 1248 and was used in the thermal system for the AP process. During a process upset in 1967 to 1968, the reactants accidentally mixed into the thermal circulating system. Upon recirculating back into the storage tank, the mixture became gel-like and unusable. A disposal pit was excavated next to the control room, and approximately 2,000 gallons of PCB thermal fluid were drained from the storage tank and heater via an earthen trench to the excavated containment pit which is currently referred to as the PCB Disposal Area. The PCB Disposal Area was then covered with clean fill and trap rock. The thermal system was recharged with PCB heat transfer fluid consisting of Aroclor 1248 at that time. When the system was converted in 1972 to a non-PCB containing fluid, the tank containing 2,000 gallons of PCB thermal fluid was again drained to the PCB Disposal Area and re-covered with clean fill and trap rock (PAS-00073345). The trench and PCB Disposal Area were unlined (PAS-00073363) and was underlain by a peat layer (PAS-00074781). According to March 1, 1996 letter, the PCB Disposal Area was located approximately 560 feet from the Passaic River (PAS-00073344).

PCB-containing products were warehoused at the site pending final shipment to local customers between 1975 and 1977. The PCB-containing products were "Inerteen 70-30" and "Pyranol A13B3B-3" which both contained Aroclor 1254 (PAP-00207162). A site map is presented below (PAS-00073481):

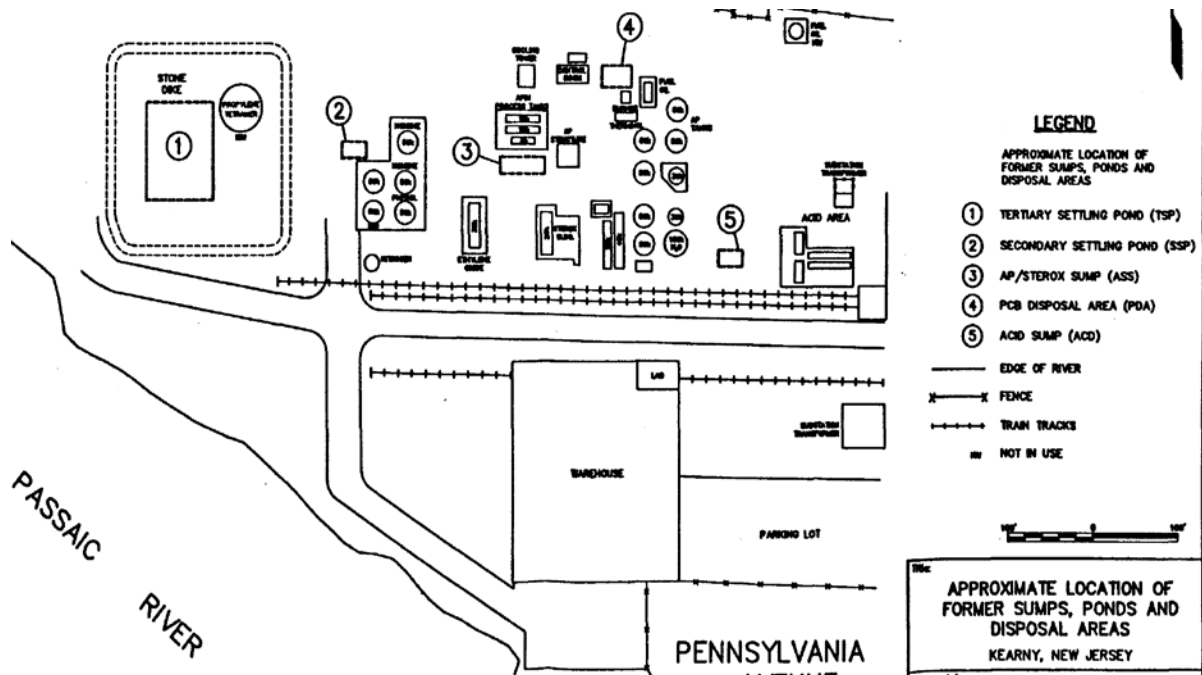
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The location of the PCB disposal area relative to the Passaic River is depicted below (PAS-00073509):



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In addition to Monsanto's operations at the site, a *Site Evaluation Submission*, dated October 25, 1991, states that approximately eight acres of the site were leased for use by American Presidential Intermodal Company as a trucking terminal (PAS-00073453, 84, 89).

4. Identified COCs

- PCBs (used and detected)
- PAHs (used and detected)
- Copper (detected)
- Lead (detected)
- Mercury (used and detected)

PCBs

According to a March 1, 1996 letter, PCBs were used at the site from 1960 to 1972 as a non-contact heat-transfer fluid in production equipment. The heat-transfer fluid consisted of Aroclor 1248. On two occasions (1968 and 1972), 2,000 gallons of PCB-containing heat transfer fluids were drained into an excavated containment pit via an earthen trench next to a plant control room, located approximately 560 feet from the Passaic River (PAS-00073344). The trench and disposal area were unlined (PAS-00073363) but were covered with soil and trap rock (PAS-00073345; PAP-00035295-96) and underlain by a peat layer (PAS-00074781).

In 1983, Aroclor 1248 was detected in soil at a maximum concentration of 507,000 mg/kg (PAS-00073515). Aroclor 1260 was detected at a maximum concentration of 200 mg/kg in 1991 (PAP-00036359). According to a Memorandum re: Comments on Monsanto 104(e) Response, dated June 29, 1995 (1995 Memorandum), maximum soil concentrations measured in 1983 and 1984 in the PCB Disposal Area were 436,000 parts per million (ppm), 507,000 ppm, 195,000 ppm, and 186,000 ppm. The 1995 Memorandum also states that PCBs were detected at elevated concentrations in the Secondary Settling Ponds west of the PCB Disposal Area at concentrations as high as 280 ppm (PAS-00013251).

According to a *Remedial Investigation Work Plan*, dated December 18, 1989, the PCB disposal area was initially excavated in 1979 and 85 cubic yards of PCBs and PCB saturated soils were removed from the containment pit and transported off-site by SCA Chemical Services for disposal at Chemical Waste Management's Model City, New York facility (PAP-00035290-91, 473-475; PAP-00212803). A December 1, 1982, *Environmental Assessment Report*, prepared by Monsanto, also notes "The buried PCB material has been dug up and drummed. The material has been sent to an approved Class I chemical landfill site" (PAP-00035150). In addition to the foregoing, according to a Remedial Action Report, dated November 11, 1994, in 1994, 5,521.65 tons of PCB-contaminated soil and 308.18 tons of PCB-contaminated concrete demolition debris were removed from the site and disposed off site (PAS-00074804).

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PCB-containing products were warehoused at the site pending final shipment to local customers between 1975 and 1977. The PCB-containing products were “Inerteen 70-30” and “Pyranol A13B3B-3” which both contained Aroclor 1254 (PAP-00207162).

PAHs

According to a civil complaint filed by the NJDEP against Monsanto on November 1, 1988, Monsanto used naphthalene in its operations (PAP-00212793-94). The document provides no details on how it was used or handled, and it is noted that reference to use of naphthalene is not identified in other files reviewed. According to an *Environmental Assessment*, dated December 1, 1982, naphthalene was detected in sanitary waste at a concentration of 5.4 microgram per liter (µg/L) (PAP-00035161) but not in the process wastewater (PAP-00035157, 161). High molecular weight polynuclear aromatic hydrocarbons (PAHs) were detected in site soil (PAS-00073823).

Copper

According to an *Environmental Assessment*, dated December 1, 1982, “major” raw materials used at the site included copper sulfate (PAP-00035075). The report provides no details on how it was used or handled, and it is noted that reference to use of copper sulfate is not identified in other files reviewed.

In 1976, copper was detected in site wastewater at a concentration of 0.2 milligrams per liter (mg/L) (PAP-00034841). In May 1978, copper was detected in site wastewater at a concentration of 0.3 mg/L (PAP-00034943). According to the *Environmental Assessment*, dated December 1, 1982, site wastewater was sampled in December 1978, and copper was identified in process wastewater at a concentration of 38 µg/L. In addition, copper was identified in sanitary waste at a concentrations of 240 µg/L (PAP-00035149-50, 57). It is noted that copper also was detected in the city water at the facility at a concentration of 72 µg/L (PAP-00035164).

In 1990, copper was detected in soil at a maximum concentration of 645 mg/kg (PAS-00073580).

Lead

In 1976, lead was detected in site wastewater at a concentration of 0.8 mg/L (PAP-00034841). In May 1978, lead was detected in site wastewater at a concentration of 0.28 mg/L (PAP-00034943). According to an *Environmental Assessment*, dated December 1, 1982, lead was identified in sanitary waste at a concentration of 400 µg/L in December 1978 (PAP-00035149-50, 57). It is noted that lead also was detected in the city water at the facility at a concentration of 44 µg/L (PAP-00035164).

In 1990, lead was detected in soil at a maximum concentration of 676 mg/kg (PAS-00073580).

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Mercury

According to a *Site Evaluation Submission*, dated October 25, 1991, one to ten pounds of mercury in a glass bottle was present in the maintenance shop (PAS-00073501).

In 1976, mercury was detected in site wastewater at a concentration of 10 µg/L (PAP-00034841). In May 1978, mercury was detected in site wastewater at a concentration of 2.2 µg/L (PAP-00034943). According to an *Environmental Assessment*, dated December 1, 1982, mercury was identified in sanitary waste at a concentration of 43 µg/L in December 1978 (PAP-00035149-50, 57).

In 1990, mercury was detected in soil at a maximum concentration of 74 mg/kg (PAS-00073580).

Historic Fill

The Allocation Team has determined that the facility site is located on regional Historic Fill as designated by the NJDEP.¹

NJDEP has established that Historic Fill deposited in the Coastal Plain and Piedmont regions of New Jersey is known to contain the OU2 COCs: PAHs, lead, copper, and mercury.² Accordingly, NJDEP technical requirements for property containing Historic Fill requires sampling for the EPA Target Compound List for PAHs and Target Analyte List for metals, including lead, copper, mercury, and the OU2 PAH COCs.³ PAHs, lead, copper, and mercury are recognized by NJDEP to be constituents of Historic Fill at varying levels, not atypically at or exceeding residential soil standards.⁴

According to a *Draft Interim Report*, dated April 1993, solid fill material has been periodically distributed over the area of the site to sufficiently build a permanent land base above the water table, and that successive surface grading and accumulation of solid fill material provided the subbase for the current site. The report states that the origin and composition of the solid fill material is unknown, and that filling occurred prior to 1940 (PAS-00013367).

¹*Digital Geodata Series, DGS04-7, Historic Fill for New Jersey*, <https://www.nj.gov/dep/njgs/geodata/dgs04-7.htm>, Quadrangle No. 52 & No. 53 (NJDEP map identifying locations of recognized historic fill).

² *Characterization of Ambient Levels of Selected Metals and cPAHs In New Jersey Soils* (2002) and *Characterization of Ambient Levels of Selected Metals and Other Analytes In New Jersey Soils* (1997), studies prepared for NJDEP, Division of Science and Research, by BEM Systems, Inc.

³ New Jersey Department of Environmental Protection (NJDEP), *N.J.A.C. 7:26E Technical Requirements for Site Remediation*, Table 4-2, November 2009 [Note that Table 4-2 has been deleted from the current version of N.J.A.C. 7:26E (May 7, 2012) and the updated *Historic Fill Technical Guidance* (April 2013) as NJDEP believed that the tables list of historic fill constituents was too restrictive].

⁴ NJDEP Table 4-2 (PAHS and lead) and a summary of NJDEP records regarding investigations of properties in the vicinity of the Passaic River recognized to be located in areas of Historic Fill indicate that the following average/maximum (mg/kg) contamination levels of OU2 COCs exist in area Historic Fill: PAHs (1.91/160), lead (574/10,000), copper (11.2/1,200), and mercury (0.21/3.7).

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Fill has been reported in the *Preliminary Remedial Investigation Report*, dated August 30, 1991, between approximately 0 to 6 feet below ground surface (bgs) (PAS-00073616).

The levels of PAHs, copper, lead and mercury detected at the site in soils are presented in the table below (PAS-00073580; PAS-00073823).

COCs Found in Onsite Soils	
COC	Max Detected Concentration
Lead	645 mg/kg
Copper	676 mg/kg
Mercury	74 mg/kg
Benzo(a)anthracene	16 mg/kg
Benzo(a)pyrene	14 mg/kg
Benzo(b)fluoranthene	30 mg/kg
Dibenzo(a,h)anthracene	2.7 mg/kg
Indeno(1,2,3-cd)pyrene	9 mg/kg

5. COC Pathways

Settling Ponds

Settling ponds were used between approximately 1960 and 1977. According to a *Preliminary Remedial Investigation Report*, dated August 30, 1991, past disposal practices for the AP/Sterox production included the use of a former AP/Sterox Sump and settling ponds. The AP/Sterox Sump received Sterox filter cake and floor wash water from the AP/Sterox production area during maintenance operations. The waste wash water entered the sump through concrete troughs under the process pumps servicing the AP/Sterox structures. According to interviews with Monsanto employees, the area flooded under heavy precipitation due to shallow water table conditions and relatively low permeable soils. The AP/Sterox Sump was connected by an underground clay-tile pipe to a Secondary Settling Pond and a larger Tertiary Setting Pond to catch overflow from the sump. The AP/Sterox Sump was manually cleaned of settled solid wastes with the solids transported off site to a landfill. The AP/Sterox Sump and Secondary Settling Pond were operated from about 1960 to 1977. The larger Tertiary Setting Pond was operated from about 1966 to 1970 (PAS-00073612-13).

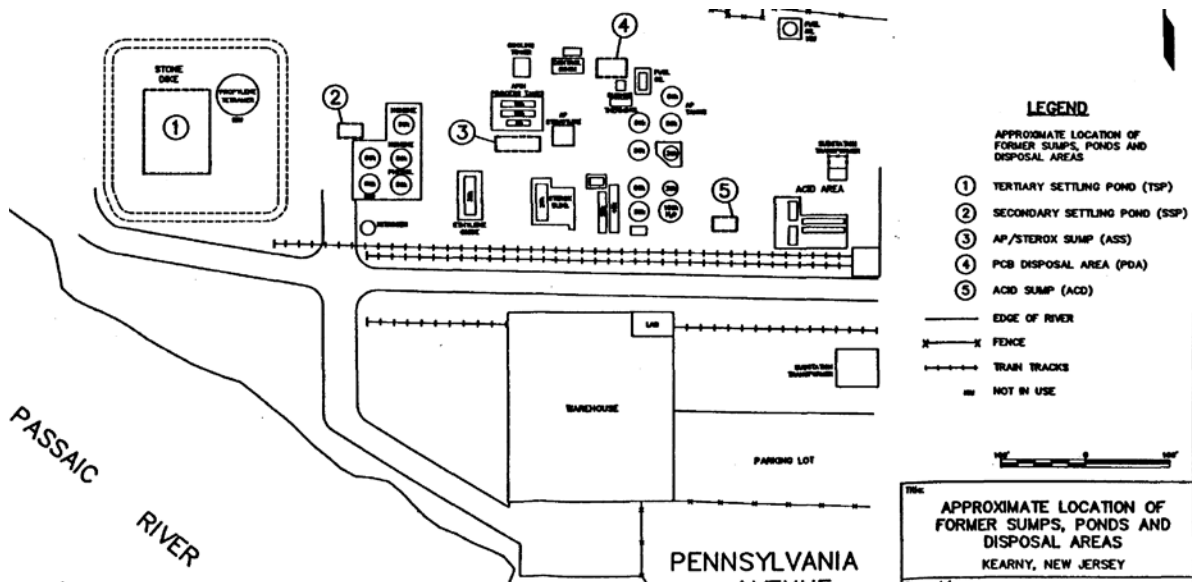
According to a March 1, 1996 letter, during high precipitation events, flooding in the area of the PCB Disposal Area was controlled via a system of earthen trenches, subsurface overflow piping, and ponds that linked the PCB Disposal Area, the AP/Sterox Sump, and the Secondary Settling Pond. According to the March 1, 1996 letter, in previous interviews with site personnel, the only known flood event in which substantial flooding had occurred over the last thirty years (from process area to the north of the warehouse) occurred in 1992. It goes on to state that although minor flooding occurred on occasion within small localized areas around the plant, no evidence of flood events carrying contaminated soils to the storm sewer or Passaic River have ever been documented. The approximate distance from the edge of the river to these features reportedly ranged

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from 350 feet to the beginning of the process area to 560 feet to the PCB Disposal Area (PAS-00073349).

The locations of the settling ponds relative to the Passaic River are depicted below (PAS-00073509):



Sanitary Sewer

According to *Monsanto's Response to Request for Information Concerning the Diamond Alkali Superfund Site Passaic River Study Area*, dated February 3, 1995, the site was "not a direct discharger and all such sewer discharges since 1955 went to POTW [publicly owned treatment works]" (PAS-00073429).

According to a *Waste Effluent Survey*, dated April 12, 1972, Monsanto discharged 19,345,000 gallons of wastewater to the sanitary sewer and 20,805,000 gallons of wastewater to the "storm sewer, river, or ditch" in 1971. No OU2 COCs were reported in the discharge according to the form (PAS-00003878). Wastewater was not pretreated prior to discharge (PAS-00003879).

According to a July 25, 1975 letter, all wastewater discharge went to the "South Kearny treatment plant" which emptied to the "Hackensack system." The letter stated that at one time, the site had a storm drain from the property which emptied into the Passaic River, but that this drain no longer exists (PAS-00003881).

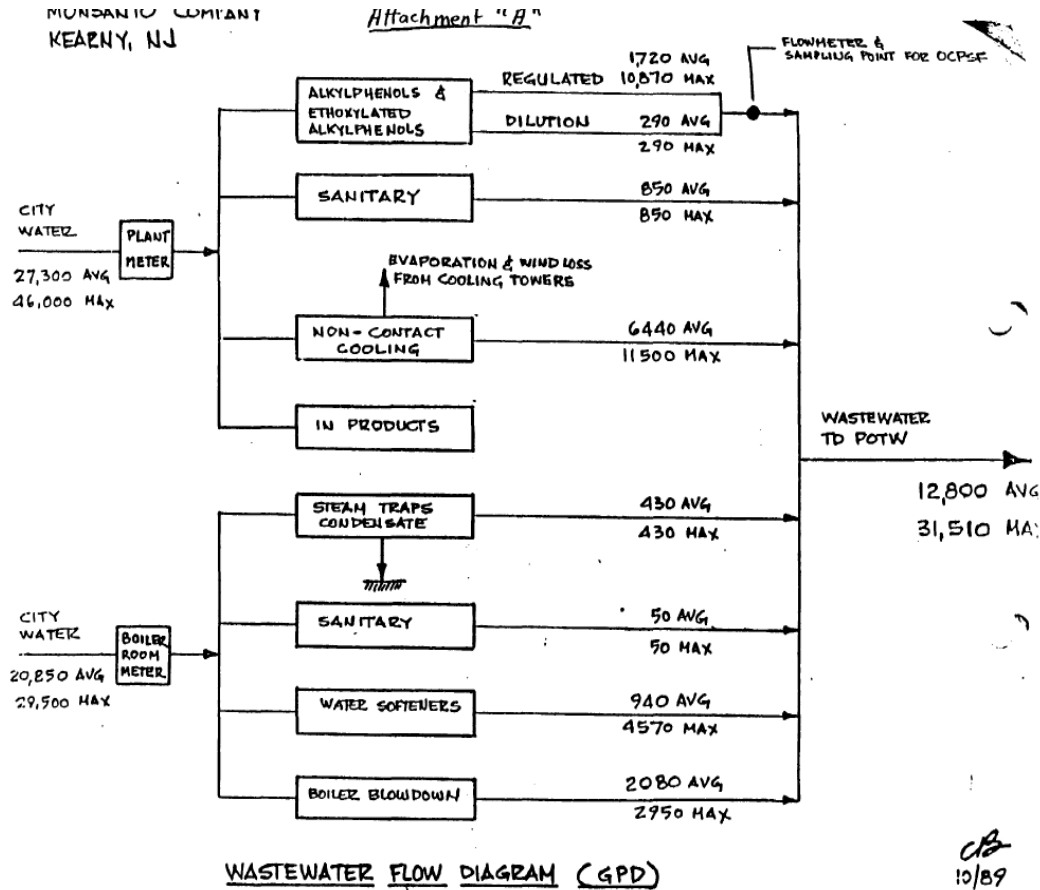
According to a December 30, 1976 Monsanto file titled *Water Quality Control*, "the only direct discharge" to the Town of Kearny sanitary sewer system is pumped from a collection sump at the east end of the site to the Kearny sewer system. It states that the flow rate averaged 35 gallons per minute, and the effluent consisted primarily of sanitary wastes plus process wastes from the Sterox/AP area. No OU2 COCs were identified as being present in the discharge (PAP-00034838).

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A wastewater flow diagram dated October 1989 is presented below (PAS-00013319):



According to an *Industrial Pretreatment Inspection Report*, dated September 13, 1990, the site was connected to the Kearny POTW under a New Jersey Pollutant Discharge Elimination System (NJPDES) permit (No. 0022161). The report also states that wastewater was discharged to the public sewer only, and that the discharge volume was approximately 1,200 gallons per day. It is reported that no pretreatment of the wastewater occurred (PAS-00013312-14).

According to a *Site Evaluation Submission*, dated October 25, 1991, beginning in November 1990, wastewater was pretreated through an oil/water separator before being discharged to the PVSC system (PAS-00073446). Prior to the 1990 connection to the PVSC, the sewage system was connected to the Kearny Waste Water Treatment Plant (PAS-00073495).

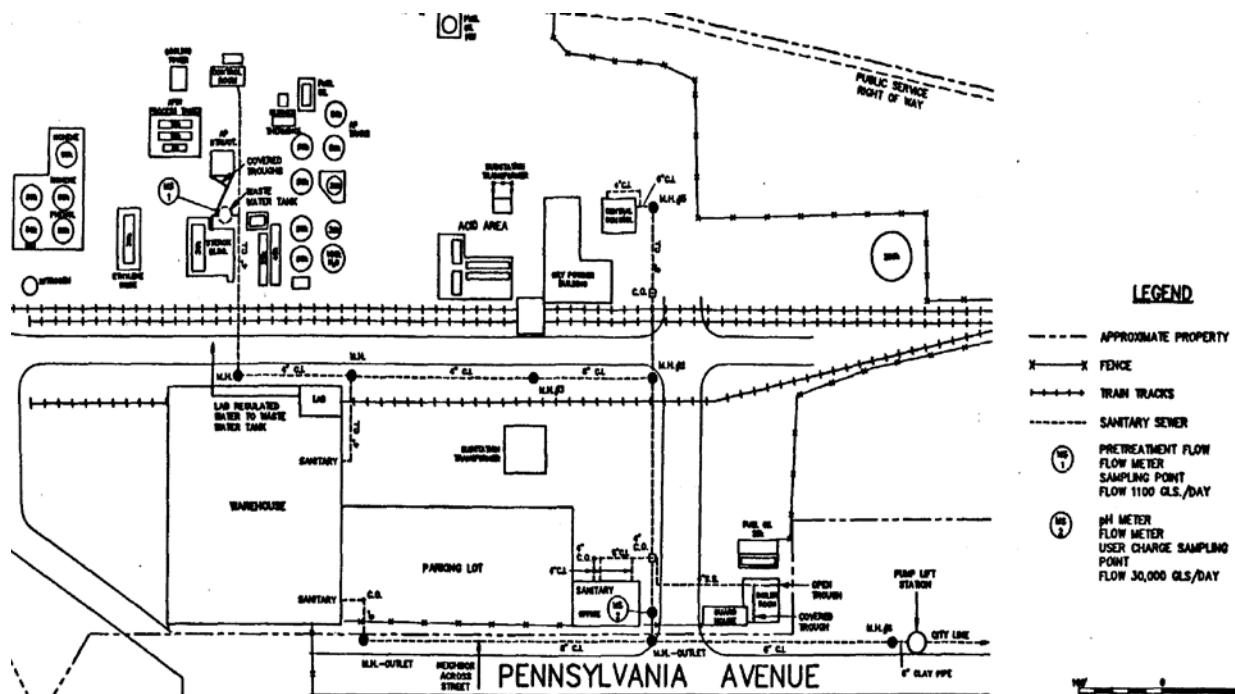
This report goes on to state that industrial and sanitary wastewater was discharged to an on-site sanitary sewer, which was permitted for connection to a POTW operated by the PVSC. Two permitted sewerage connections occurred on the site. Within the process area, industrial waste streams included the laboratory, Sterox process, and the AP process. Floating organic product possibly present was skimmed and separated to a

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tank for non-hazardous waste disposal. The combined water stream was sampled monthly for 32 priority pollutants. After treatment, the wastewater was piped to the on-site sanitary sewer system where it was combined with sanitary waste water from the other on-site buildings (PAS-00073495). The report also states that PVSC permitted this sewage connection under permit number 15406751-00000-0151; a second permitted sewage connection from permit number 15406752-00000-0151 was monitored by a separate meter. This discharge included only the sanitary waste from the warehouse (PAS-00073495).

A figure depicting the sanitary sewer lines at the site is presented below (PAS-00073496):



Storm Water Discharges

According to a March 1, 1996 letter, to Monsanto's knowledge, the only historical direct discharge pipe from the site to the Passaic River was a 27-inch diameter storm sewer pipe which was abandoned in October 1973. Prior to this date, the storm sewer line did not enter nor receive surface water discharge from the process area (PAS-00073348). *PVSC Annual Reports for 1972 through 1976* state that Monsanto also had an indirect discharge of storm water to the Passaic River via a 24-inch city storm sewer used by others besides Monsanto (PAS-00003885, PAP-00329967; PAS-00035315). According to the March 1, 1996 letter, the 24-inch diameter pipe was owned by the Town of Kearny, and the site discharged storm water from "an isolated portion of its plant (upgradient of the PCB Disposal Area)" through a 10-inch diameter line which tied into the 24-inch diameter Kearny storm sewer line; however, this line was also disconnected in 1973 (PAS-00073348).

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In addition, according to the *PVSC Annual Report*, dated 1973, Monsanto planned to abandon the plant sewer system and plug it so that no flow would come from the site to the Passaic River; they also stated they would disconnect their connections to the 10-inch sewer line running along Pennsylvania Avenue (PAS-00034749). On October 17, 1973, Monsanto informed the United States Environmental Protection Agency (EPA) that it would abandon and seal its No. 001 outlet to the Passaic River before December 31, 1973, and it would withdraw its application for a discharge permit as of January 1, 1974. On October 25, 1973, Monsanto sealed its outlet to the Passaic River (PAS-00034750).

Groundwater Discharge

A *PVSC Annual Report*, dated 1974, states that groundwater entered the storm sewer and discharged to the Passaic River. The report states that phosphate in groundwater was entering the storm sewer, which is not an OU2 COC (PAS-00034924).

According to a March 1, 1996 letter, a downgradient recovery/interceptor trench and product recovery systems were installed in the mid-1980s as a safeguard to intercept and contain any potential discharges to the Passaic River (PAS-00073346).

Spills

According to an *Environmental Assessment*, dated December 1, 1982, a study was underway in 1982 "to evaluate and correct" wastewater discharge to the ground (PAP-00035068). It is unclear if OU2 COCs were associated with wastewater discharges to the ground.

6. Regulatory History/Enforcement Actions

Inspections

According to a *PVSC Annual Report*, dated 1972, samples collected from 24-inch municipal storm sewer and 27-inch Monsanto storm sewer discharging to the Passaic River were found to be "polluting;" however, there is no indication that COCs were the source of contamination. Rather, the document stated that ortho phosphate was the contaminant (PAS-00003885). This issue remained in 1973 but was addressed that year (PAS-00034748-50). Because no OU2 COCs were reported to be associated with the discharge, this is not discussed further herein.

Violations/Enforcement Actions

According to an Administrative Consent Order between NJDEP and Monsanto, dated July 24, 1989 (1989 ACO), on November 14, 1986, Monsanto submitted to NJDEP a report which stated that in the mid-1960s approximately 2,000 gallons of heat transfer liquid containing PCBs were landfilled on site. NJDEP filed a civil complaint against Monsanto on November 1, 1988 for failure to immediately notify NJDEP of the full nature and extent of discharges of hazardous substances which it caused to occur at the site, including the release of PCBs and petroleum hydrocarbons (PAP-00212791-801).

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Monsanto entered into the 1989 ACO with the NJDEP, requiring completion of a remedial investigation and feasibility study (PAS-00075167; PAP-00212802-17). The 1989 ACO resolved the civil complaint (PAP-00212863).

Permits

According to an *Industrial Pretreatment Inspection Report*, dated September 13, 1990, the site was connected to the Kearny POTW under a NJPDES permit (No. 0022161). Prior to a 1990 connection to the PVSC, the sewage system was connected to the Kearny Waste Water Treatment Plant (PAS-00073495). According to a *Site Evaluation Submission*, dated October 25, 1991, industrial and sanitary wastewater was discharged to an on-site sanitary sewer, which was permitted for connection to a POTW operated by PVSC. Two permitted sewerage connections occurred on the site. PVSC permitted the sewage connections under permit numbers 15406751-00000-0151 and 15406752-00000-0151 (PAS-00073495).

According to an *Environmental Assessment*, dated December 1, 1982, in 1982 the site did not have a National Pollutant Discharge Elimination System (NPDES) permit, but would be required to obtain one in 1983-1984 due to "new state regulations" (PAP-00035068).

7. Response Actions

Characterization Activities

The following characterization activities have taken place at the facility:

- *Site Evaluation Submission*, dated October 25, 1991 (PAS-00073442).
- *Preliminary Remedial Investigation Report*, dated August 30, 1991 (PAS-00073591)
- *Focused Feasibility Study and Identification of Site Specific Cleanup Standards*, dated June 18, 1993 (PAS-00104087);
- *Remedial Action Report*, dated November 11, 1994 (PAS-00074723).

Sewer

According to an *Environmental Assessment*, dated December 1, 1982, naphthalene was detected in sanitary waste at a concentration of 5.4 µg/L (PAP-00035157, 161) but not in the process wastewater (PAP-00035157, 161).

In 1976, mercury was detected in site wastewater at a concentration of 10 µg/L (PAP-00034841). In May 1978, mercury was detected in site wastewater at a concentration of 2.2 µg/L (PAP-00034943). According to an *Environmental Assessment*, dated December 1, 1982, mercury was identified in sanitary waste at a concentration of 43 µg/L in December 1978 (PAP-00035149-50, 57).

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In 1976, copper was detected in site wastewater at a concentration of 0.2 milligrams per liter (mg/L) (PAP-00034841). In May 1978, copper was detected in site wastewater at a concentration of 0.3 mg/L (PAP-00034943). According to the *Environmental Assessment*, dated December 1, 1982, site wastewater was sampled in December 1978, and copper was identified in process wastewater at a concentration of 38 µg/L. In addition, copper was identified in sanitary waste at a concentrations of 240 µg/L (PAP-00035149-50, 57). It is noted that copper also was detected in the city water at the facility at a concentration of 72 µg/L (PAP-00035164).

In 1976, lead was detected in site wastewater at a concentration of 0.8 mg/L (PAP-00034841). In May 1978, lead was detected in site wastewater at a concentration of 0.28 mg/L (PAP-00034943). According to an *Environmental Assessment*, dated December 1, 1982, lead was identified in sanitary waste at a concentration of 400 µg/L in December 1978 (PAP-00035149-50, 57). It is noted that lead also was detected in the city water at the facility at a concentration of 44 µg/L (PAP-00035164).

Soil

According to a March 1, 1996 letter, PCBs were used at the site from 1960 to 1972 as a non-contact heat-transfer fluid in production equipment. On two occasions (1968 and 1972), 2,000 gallons of PCB-containing heat transfer fluids consisting of Aroclor 1248 were drained into an excavated containment pit via an earthen trench next to a plant control room, located approximately 560 feet from the Passaic River (PAS-00073344).

According to a Memorandum re: Comments on Monsanto 104(e) Response, dated June 29, 1995, maximum Aroclor 1248 soil concentrations measured in 1983 and 1984 in the PCB Disposal Area were 436,000 ppm, 507,000 ppm, 195,000 ppm, and 186,000 ppm at sample locations B-2A, B-5, B-24, and B-26, respectively. The Memorandum also states that PCBs had been detected at elevated concentrations in the Secondary Settling Ponds, west of the PCB Disposal Area. Aroclor 1248 was detected at a maximum concentration of 1,100 mg/kg at the Secondary Settling Ponds. Sample location SSP-1, located approximately 340 feet from the Passaic River, contained Aroclor 1248 at 280 ppm and Aroclor 1260 at 43 ppm. In contrast, sample location SSP-5, also just over 300 feet from the Passaic River, contained Aroclor 1260 at a maximum concentration of 200 ppm, but no Aroclor 1248 (PAP-00036357, 59; PAS-00013251; PAS-00073515).

According to the March 1, 1996 letter, the four sample locations cited above (B-2A, B-5, B-24, B-26) were the four locations with the highest PCB concentrations. The letter states that ChemRisk correctly noted that these samples were collected at a depth of 4 to 6 feet bgs; however, ChemRisk does not mention that continuous split-spoon sampling was performed in the PCB Disposal Area to a depth of 28 feet bgs and that PCB concentrations decreased from the four to six feet interval to the six to eight feet interval by one to three orders of magnitude. The March 1, 1996 letter states that this decrease illustrates the limited mobility and vertical migration of PCBs at the site (PAS-00073351). According to data presented in a *Site Evaluation Submission*, dated October 25, 1991, PCB were detected at depths at least as deep as 16 feet bgs, with a maximum Aroclor 1248 concentration of 16,500 mg/kg. The highest concentrations

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were in samples collected from four to six feet bgs. Concentrations of Aroclor 1248 in surface soil were as high as 36,000 mg/kg (PAS-00073515).

In addition to the PCB Disposal Area, according to the *Focused Feasibility Study and Identification of Site Specific Cleanup Standards*, dated June 18, 1993, the AP/Sterox Sump was targeted for investigation based on its historical use as a waste wash water sump. According to plant personnel, the AP/Sterox Sump served as a collection point for wash water which collected in concrete troughs beneath the process area. The AP/Sterox Sump was manually cleaned of settled solid wastes which were disposed off-site. This unit was sampled at the four to six-foot and nine to 11-foot intervals. The concentrations of PCBs were several orders of magnitude less than the PCB Disposal Area. The higher concentrations were detected at four to six feet bgs which corresponded to the nominal depth of this unit (PAS-00104096). The Secondary Settling Pond was operated from about 1960 to 1977. As described above, waste wash water was directed to the AP/Sterox Sump; however, during heavy rainfall the AP/Sterox Sump unit could not handle the influent water and overflow was directed to the Secondary Settling Pond by an underground terra-cotta pipe. Residual materials were carried to the Secondary Settling Pond by this mechanism. The PCB concentrations in the Secondary Settling Pond were in the range, but lower than the AP/Sterox Sump, and many orders of magnitude less than the PCB Disposal Area. The highest concentration was observed at the four to six-foot interval bgs (PAS-00104096).

With respect to metals, the following maximum concentrations were detected in surface soil at the AP/Sterox Sump, Secondary Settling Pond, and Tertiary Settling Pond in 1990 (PAS-00073580-81):

Maximum Metals Concentrations in Surface Soil at the AP/Sterox Sump, Secondary Settling Pond, and Tertiary Settling Pond in 1990			
Metal	AP/Sterox Sump	Secondary Settling Pond	Tertiary Settling Pond
Mercury	1.2 mg/kg	0.4 mg/kg	0.6 mg/kg
Copper	645 mg/kg	95 mg/kg	76.4 mg/kg
Lead	676 mg/kg	217 mg/kg	160 mg/kg

In addition, the following maximum concentrations were detected in subsurface soil (4 to 6 feet below ground surface) at the AP/Sterox Sump, Secondary Settling Pond, and Tertiary Settling Pond in 1990 (PAS-00073561, 65, 69):

Maximum Metals Concentrations in Subsurface Soil at the AP/Sterox Sump, Secondary Settling Pond, and Tertiary Settling Pond in 1990			
Metal	AP/Sterox Sump	Secondary Settling Pond	Tertiary Settling Pond
Mercury	1.8 mg/kg	0.4 mg/kg	0.9 mg/kg
Copper	316 mg/kg	91.4 mg/kg	140 mg/kg
Lead	380 mg/kg	149 mg/kg	137 mg/kg

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Remedial Activities

Soil

According to the 1989 ACO, on November 14, 1986, Monsanto submitted to NJDEP a report which stated that in the mid-1960s approximately 2,000 gallons of heat transfer liquid containing PCBs were landfilled on site. According to a civil complaint filed by NJDEP against Monsanto on November 1, 1988, in 1979, Monsanto attempted to resolve the discharge of the heat transfer liquid through performance of self-determined cleanup activities. It states that Monsanto "apparently removed" approximately 85 cubic yards of PCB contaminated soil which was subsequently disposed of at an undesignated, off-site hazardous waste landfill (PAP-00212791-96). According to a *Remedial Investigation Work Plan*, dated December 18, 1989, the PCB disposal area was initially excavated in 1979 and 85 cubic yards of PCBs and PCB saturated soils were removed from the containment pit and transported off-site by SCA Chemical Services for disposal at Chemical Waste Management's Model City, New York facility (PAP-00035290-91, 473-475; PAP-00212803). According to the 1989 ACO, NJDEP was supplied with copies of the associated waste manifests (PAP-00212803). The civil complaint goes on to state that Monsanto was unsuccessful in removing the entire quantity of contaminated soil as evidenced by a subsequent finding. It goes on to state that in 1984, without coordinating and obtaining approval from NJDEP, Monsanto installed a series of shallow and deep monitoring wells on the site to monitor the presence of hazardous substances and pollutants in groundwater. Thereafter, in October 1984, without coordinating and obtaining approval from NJDEP regarding remedial action to be taken at the property, Monsanto began sampling the wells. This sampling activity resulted in the discovery of Aroclor 1248 as well as petroleum hydrocarbons. In October 1984, without coordinating and obtaining approval from NJDEP regarding remedial action to be taken at the property, Monsanto collected soil borings which revealed quantities of Aroclor 1248 in soil surrounding the AP/Sterox Sump at concentrations up to 123,000 ppm (PAP-00212791-96).

Additionally, Monsanto discovered the presence of petroleum hydrocarbons in the site's soil and dug four "test pits" in the area of the AP/Sterox Sump. Subsequent to this, excavation revealed the presence of a floating organic layer of petroleum hydrocarbons. In September 1986, during the installation of a dike around an above-ground fuel oil tank at the property, Monsanto discovered a viscous floating substance containing No. 4 and No. 6 fuel oils (PAP-00212791-96).

According to a *Focused Feasibility Study and Identification of Site Specific Cleanup Standards*, dated June 18, 1993, in correspondence dated September 16, 1992, NJDEP identified that the areas of concern (AOCs) at the site have been fully characterized, are media-specific, and "are of limited extent." It also states that NJDEP and Monsanto agreed that the three site AOCs include the PCB Disposal Area, the AP/Sterox Sump, and the Secondary Settling Pond impacted by PCBs, and that any low-level, residuals outside of these AOCs would be managed by engineering and institutional controls (PAS-00104095).

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According to a March 1, 1996 letter, PCB-impacted soils were delineated, and subsequently remediated, during two separate remedial events (1979 and 1994). These activities were documented in reports submitted to NJDEP including Roux's *Preliminary Remedial Investigation Report*, dated August 30, 1991 and *Remedial Action Report*, dated November 11, 1994. According to the March 1, 1996 letter, "no PCBs were ever found to be discharged to the Passaic River, either directly or indirectly, by overland flow, ground-water flow, or through underground sewer pipe, conduits, or any other manner" (PAS-00073344).

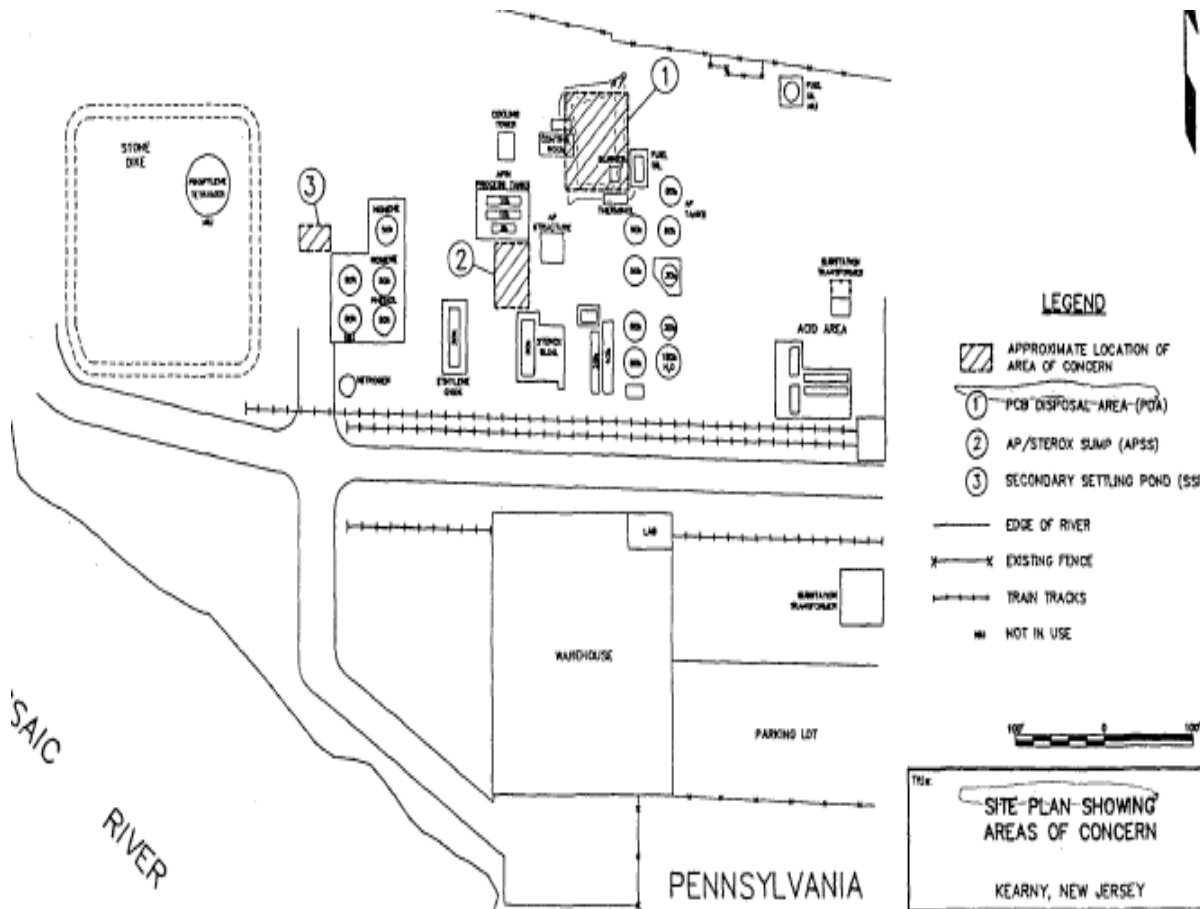
According to a *Remedial Action Report*, dated November 11, 1994, the following remedial activities took place in 1994:

- Approximately 305 cubic yards of PCB-contaminated soil were excavated from the Secondary Settling Pond. Post-excavation soil samples in the Secondary Settling Pond showed that total PCB concentrations were less than 33 mg/kg at a depth of nine to 10.5 feet bgs following excavation activities.
- Approximately 806 cubic yards of contaminated soil were excavated from the AP/Sterox Sump. Post-excavation soil samples in AP/Sterox Sump showed that total PCB concentrations were less than 14 mg/kg at a depth of nine feet bgs following excavation activities.
- Approximately 1,718 cubic yards of contaminated soil were excavated from the inner PCB Disposal Area. Post-excavation soil samples in the inner PCB Disposal Area showed that total PCB concentrations were non-detect at 24 feet bgs following excavation activities.
- Approximately 1,157 cubic yards of contaminated soil were excavated from the outer PCB Disposal Area. Post-excavation soil samples in the outer PCB Disposal Area showed that total PCB concentrations were less than 51 mg/kg at a depth of nine feet bgs following excavation activities (PAS-00074803-04).

In addition to the 85 cubic yards of PCB-contaminated soil excavated in 1979, in 1994 5521.65 tons of PCB-contaminated soil and 308.18 tons of PCB-contaminated concrete demolition debris were removed from the site and disposed off-site (PAS-00074804). Presented below is a figuring depicting the extent of AOCs (PAS-00104121):

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Monsanto received a "no further action" designation for soil from NJDEP on December 13, 1995 (PAS-00073348; PAS-00073369). Areas of the site remained which contained contaminant concentrations above NJDEP residential direct contact soil cleanup criteria, so institutional controls to restrict use of the site were implemented (PAS-00073369).

According to a *Description of the Affected Area* document, NJDEP had provided approval to obtain a Declaration of Environmental Restrictions (DER) for the "Affected Area". The size of the "Affected Area" was estimated to be approximately 135,811 square feet. Surface and subsurface soil analytical results showed that some exceedances of the NJDEP's residential direct contact soil cleanup criteria remained on the site following the completion of remedial activities. According to the document, the OU2 COCs that were detected at levels exceeding NJDEP guidance criteria included the following:

- Mercury
- Lead
- PCBs
- Benzo(a)pyrene
- Benzo(a)anthracene
- Indeno(1,2,3-cd)pyrene
- Benzo(k)fluoranthene
- Chrysene (PAS-00124920).

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Monsanto received a Conditional No Further Action Letter from NJDEP on November 5, 2010, which states that a No Further Action Letter for soils only was issued on July 12, 1996. The Conditional No Further Action Letter required “monitoring for compliance with engineering and institutional controls” and to submit biennial certifications that the institutional and engineering control(s) are being properly maintained and continue to be protective of public health and safety and the environment (PAP-00036343-46).

Groundwater

According to the March 1, 1996 letter, the presence of clean boundary wells at the site, as demonstrated by numerous sampling events, refuted arguments by Maxus Energy Corporation regarding the discharge of PCB-contaminated groundwater from the site into the Passaic River. Both deep and shallow wells adjacent to the river were sampled by Roux between 1990 to present (1996). According to the March 1, 1996 letter, over 50 groundwater samples were collected from these wells, starting in 1985, and since the land disposal of PCBs occurred; and, to-date, PCBs have never been detected above practical quantitation limits in these downgradient monitoring wells (PAS-00073349-50). According to a *Remedial Action Work Plan*, dated December 18, 1989, PCBs were detected consistently only in a shallow and deep well cluster located in the approximate location of the former PCB Disposal Area. The maximum concentration was reported to be 131 parts per billion (ppb) (PAP-00035331).

A NJDEP Ground Water Remedial Action Permit issued on May 24, 2013, does not identify any OU2 COCs in groundwater (PAP-00212877).

8. Summary of Asserted Defenses

Pharmacia asserts that, Occidental Chemical Company (OCC) is currently the sole party implementing the Remedial Design for OU2 which is projected by EPA to cost approximately \$165 million. OCC released 41 parties, including Pharmacia, from Occidental’s claim for these Remedial Design Costs related to OU2. Accordingly, any allocation of OU2 costs that includes OCC and Pharmacia must reflect this release of liability by OCC for the OU2 RD [remedial design] which OCC is performing. The release was entered into in the context of the Maxus bankruptcy proceeding and is explained at paragraph 44 of Occidental’s June 30, 2018 Complaint. This information was also provided to EPA on June 23, 2017. It’s also noteworthy that the pleadings in the bankruptcy proceeding explained the rationale for settling these claims as against some parties, and not others. Specifically, ‘The Debtors sought to eliminate those parties that (a) appeared to either be de minimis contributors or (b) had previously contributed to the investigation and remediation costs in amounts roughly proportionate to their share of liability.’ Maxus Bankruptcy Docket No. 1232 at 24, filed April 19, 2017.